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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 1, 1983 Volume 1027 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

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GENERAL INFORMATION concerning TRADEMARKS.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Dec. 1982

Affirmed	139
Affirmed in part	12
Reversed	48
Total	199

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,253,103, Re. S.N. 363,241, Filed Mar. 29, 1982, Cl. 337/161, PROTECTOR FOR ELECTRIC CIRCUITS, Aloysius J. Fister, Owner of Record: *McGraw-Edison Co., Elgin, Ill.,* Attorney or Agent: Rey Eilers, et al., Ex. Gp.: 212

3,814,730, Re. S.N. 372,816, Filed Apr. 28, 1982, Cl. 528/15, PLATINUM COMPLEXES OF UNSATURATED SILOXANES AND PLATINUM CONTAINING ORGANOPOLYSILOXANES, Bruce D. Karstedt, Owner of Record: *General Electric Co., New York, N.Y.,* Attorney or Agent: Edward A. Hedman, Ex. Gp.: 142

3,829,933, Re. S.N. 402,712, Filed July 28, 1982, Cl. 17/053, METHOD AND APPARATUS FOR EVISCERATING SCALLOPS, William R. Lambert, Owner of Record: *Inventor,* Attorney or Agent: Davis Rabin, Ex. Gp.: 322

3,971,747, Re. S.N. 423,752, Filed Sept. 27, 1982, Cl. 260/375B, CURABLE COMPOSITIONS, Howard M. Bank, et al., Owner of Record: *Dow Corning Corp., Midland, Mich.,* Attorney or Agent: Harry D. Dingman, Ex. Gp.: 142

4,043,318, Re. S.N. 396,573, Filed July 9, 1982, Cl. 126/442, SOLAR ENERGY COLLECTOR, Yu K. Pei, Owner of Record: *Owens-Illinois, Inc., Toledo, Ohio,* Attorney or Agent: John R. Nelson, Ex. Gp.: 345

4,117,340, Re. S.N. 395,853, Filed July 6, 1982, Cl. 250/492.A, ELECTRON BEAM EXPOSURE SYSTEM, Eiichi Goto, et al., Owner of Record: *Rikagaku Kenkyusho, Saitamaken, Japan and Nihon Denshi Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David C. Hanson, et al., Ex. Gp.: 256

4,185,233, Re. S.N. 440,107, Filed Nov. 8, 1982, Cl. 315/276, HIGH EFFICIENCY BALLAST SYSTEM FOR GASEOUS DISCHARGE LAMPS, David H. Riesland, et al., Owner of Record: *General Electric Co., Schenectady, N.Y.,* Attorney or Agent: Norman C. Fulmer, et al., Ex. Gp.: 256

4,235,789, Re. S.N. 436,234, Filed Oct. 25, 1982, Cl. 260/380, PROCESS FOR THE PREPARATION OF 1-AMINO-2-BROMO-4-HYDROXYANTHRAQUINONE, James Robert Stout, Owner of Record: *Mobay Chemical Corp., West Pittsburgh, Pa.,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 117

4,285,234, Re. S.N. 435,992, Filed Oct. 21, 1982, Cl. 73/862.5, LOAD-MEASURING DEVICES, Dennis H. Sansome, et al., Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 244

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,869,362, Reexam. No. 90/000,309, Requested: Dec. 21, 1982, Cl. 204/157.1R, PROCESS FOR REMOVING NOXIOUS GAS POLLUTANTS FROM EFFLUENT GASES BY IRRADIATION, Sueo Machi, et al., Owner of Record: *Requester,* Attorney or Agent: Hall, Myers & Rose, Ex. Gp.: 112, Requester: Ebara Corp. and Japan Atomic Energy Research Institute, Ota-Ku, Tokyo 144, Japan

3,942,969, Reexam. No. 90/000,305, Requested: Dec. 13, 1982, Cl. 71/5, DELAYED RELEASE NUTRIENTS FOR MUSHROOM CULTURE, Alban David Carroll, Jr., et al., Owner of Record: *Requester,* Attorney or Agent: Hume, Clement, et al., Ex. Gp.: 173, Requester: Research Corp., New York, N.Y.

4,004,995, Reexam. No. 90/000,308, Requested: Dec. 21, 1982, Cl. 204/157.1H, PROCESS FOR REMOV-

ING NITROGEN OXIDES AND SULFUR DIOXIDE FROM EFFLUENT GASES, Sueo Machi, et al., Owner of Record: *Ebara Corp., Japan Atomic Energy Research Institute, Tokyo, Japan,* Attorney or Agent: Howard L. Rose, Ex. Gp.: 110, Requester: Owner

4,074,990, Reexam. No. 90/000,311, Requested: Dec. 27, 1982, Cl. 65/27, METHOD OF PREPARING COLEMANITE-CONTAINING GLASS BATCH, Stanley F. Brzozowski, et al., Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: John E. Curley, Ex. Gp.: 170, Requester: Owner

4,134,769, Reexam. No. 90/000,306, Requested: Dec. 10, 1982, Cl. 430/300, OFFSET PRINTING PLATE, Akio Yoshida, et al., Owner of Record: *Mitsubishi Paper Mills, Ltd., Tokyo, Japan,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 160, Requester: Owner

4,319,365, Reexam. No. 90/000,310, Requested: Dec. 23, 1982, Cl. 4/236, NO TOOL TOILET SEAT HARDWARE, Richard A. Bemis, et al., Owner of Record: *Bemis Mfg. Co., Sheboygan Falls, Wis.* Attorney or Agent: Gerson E. Meyers, Ex. Gp.: 240, Requester: William H. Francis, Detroit, Mich.

National Inventors Day

The Patent and Trademark Office and the National Council of Patent Law Associations will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 12, 1983, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 13, 1983, from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 11, 1983, at 5:00 p.m. The removal of all personal property from the Search Room by the early closing time would be appreciated.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Nov. 12, 1982.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Mar. 11, 1983:

DONALD J. QUIGG,
Chairman, Committee on Enrollment.

Jan. 5, 1983.

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National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

6-293,027. REMOVAL OF SUSPENDED SOLIDS FROM WATER. Department of Interior.

6-316,259. APPARATUS FOR CONTROLLING THE LEVEL OF FLUID IN A TANK. Department of the Interior.

6-318,710. REMOVAL OF HEAVY METALS FROM WATER. Department of Interior.

6-325,269. REMOVAL OF HEAVY METALS FROM WATER. Department of Interior.

6-327,539. HIGH TEMPERATURE HYDROLYSIS OF ALUMINUM SULFATE SOLUTION. Department of Interior.

6-327,544. RECOVERY OF GALLIUM FROM ACID PROCESS SOLUTIONS. Department of Interior.

6-259,349. COMPOSITE MEMBRANE FOR REVERSE OSMOSIS. Department of Interior.

6-299,439. RECOVERY OF METALS FROM GEOTHERMAL BRINE. Department of Interior.

6-310,583. TREATMENT OF SUPERALLOYS FOR RECOVERY OF METAL VALUES. Department of Interior.

6-324,174. METHOD AND APPARATUS FOR DETERMINING THE PETROLEUM CONTENT IN A ROCK MASS TO DETERMINE THE METHANE GAS CONTENT OF THE ROCK MASS. Department of Interior.

6-324,759. OXYGEN INJECTION IN REVERSE OSMOSIS DESALINATION. Department of Interior.

6-340,925. PRODUCTION OF METAL POWDER. Department of Interior.

6-348,117. RECOVERY OF POTASSIUM FROM ORES. Department of Interior.

6-376,851. SUSPENDED SEDIMENT SENSOR. Department of Interior.

6-383,060. CONCENTRATING AND RECLAIMING MAGNETIC FLUIDS. Department of Interior.

6-352,662. ENCAPSULATION BY ENTRAPMENT WITHIN POLYHYDROXY POLYMER BORATES. Department of Agriculture.

6-391,315. LIQUID-LIQUID EXTRACTION OF COBALT. Department of Interior.

6-391,316. APPARATUS FOR THE EFFICIENT MIXING OF LIQUIDS AND GASES. Department of Interior.

6-396,924. DESULFURIZATION OF CARBONACEOUS MATERIALS. Department of Interior.

6-397,735. RECOVERY OF TUNGSTEN FROM BRINES. Department of Interior.

6-401,994. APPARATUS FOR SUPPORTING A PLURALITY OF SEISMOMETERS. Department of Interior.

6-411,155. METHOD FOR SEPARATION OF HIGH-COPPER AND LOW-COPPER ALUMINUM-SILICON ALLOYS. Department of Interior.

6-416,191. REMOVAL OF ARSENIC FROM AQUEOUS SOLUTIONS. Department of Interior.

6-416,192. METHOD OF ENHANCING THE REMOVAL OF METHANE GAS AND ASSOCIATED FLUIDS FROM MINE BOREHOLES. Department of Interior.

6-423,402. MICROEMULSIONS FROM VEGETABLE OIL AND AQUEOUS ALCOHOL WITH 1-BUTANOL SURFACTANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES. Department of Agriculture.

6-427,229. MICROEMULSIONS FROM VEGETABLE OIL AND AQUEOUS ALCOHOL WITH TRIALKYLAMINE SURFACANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES. Department of Agriculture.

6-366,754. METHOD AND APPARATUS FOR EDGEWISE COMPRESSION TESTING OF FLAT SHEETS. Department of Agriculture.

6-345,512. SALT-TOLERANT MICROBIAL XANTHANASE AND METHOD OF PRODUCING SAME. Department of Agriculture.

6-352,426. PROCESS FOR THE DECOLORIZATION OF PULP MILL BLEACH PLANT EFFLUENT. Department of Agriculture.

6-375,553. LYSIS OF TRYPANOSOMA CRUZI. Department of Health & Human Services.

6-407,232. IMPLANTATION DEVICE FOR USE IN VIVO STIMULATION AND COLLECTION OF MONOCYTES FROM PERITONEUM OF VERTERBRATE. Department of Agriculture.

6-396,521. APPARATUS TO REGULATE DISPENSING OF AGRICULTURAL CHEMICALS BY ROPE WICK APPLICATORS. Department of Agriculture.

6-314,323. ALTERED BRINING PROPERTIES OF PRODUCE BY A METHOD OF PRE-BRINING EXPOSURE OF THE FRESH PRODUCE TO OXYGEN OR CARBON DIOXIDE. Department of Agriculture.

6-356,870. CONTROL OF SICKLEPOD, SHOWY CROTALARIA, AND COFFEE SENNA WITH A FUNGAL PATHOGEN. Department of Agriculture.

6-356,864. CONTROL OF PRICKLY SIDA, VELVETLEAF, AND SPURRED ANODA WITH FUNGAL PATHOGENS. Department of Agriculture.

6-378,317. ROPE WICK CHEMICAL RECOVERY APPARATUS. Department of Agriculture.

6-385,204. A PROCESS FOR PRODUCING DURABLE PRESS FABRICS THROUGH PHOSPHORYLATION. Department of Agriculture.

6-385,163. A METHOD FOR SEPARATING CLOSED BOLLS OF COTTON BY MATURITY. Department of Agriculture.

6-377,509. CONTROL OF MYCOTOXIN PRODUCTION BY CHEMICALLY AFFECTING FUNGAL GROWTH. Department of Agriculture.

6-251,404. (4,358,160) AIR DIVERSION AND DUST CONTROL SYSTEM FOR LONGWALL SHEARERS. Department of Interior.

6-258,483. (4,359,534) CONVERSION OF D-XYLOSE TO ETHANOL BY THE YEAST PACHYSOLEN TANNOPHILUS. Department of Agriculture.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,326,731, George A. Noddin, DETONATING EXPLOSIVE IN POLYTETRAFLUOROETHYLENE MATRIX AND PREPARATION, Interference No. 100,877, decided Nov. 2, 1982, claims 1, 2, 6 & 7.

Patent No. 3,455,749, Robert S. Gow, PARTICULATE EXPLOSIVE COATED WITH DISCRETE PARTICLES OF POLYTETRAFLUOROETHYLENE, Interference No. 100,878, decided Nov. 5, 1982, claims 1 & 6.

Patent No. 3,888,804, Carl E. Swanholm and Robert G. Caldwell, PHOTODEGRADABLE HYDROCARBON POLYMERS, Interference No. 100,943, decided Nov.17, 1982, claims 2, 5, & 6.

Patent No. 3,909,301, Raymond L. Schenk, Jr., POSITIVE DISPLACEMENT BONDING, Interference No. 99,525, decided June 30, 1981, claim 19.

Patent No. 4,004,031, Jozef Drabek, BIS-(0-1-ALKYLTHIO-ETHYLIMINO)-N-METHYL-CARBAMIC ACID)-N,N'-SULPHIDE INSECTICIDES, Interference No. 99,758, decided Aug. 20, 1981, claims 1–3, 5–7 & 9–12.

Patent No. 4,010,146, David D. Russell and George Shkapenko, POLYOL BLENDS AND POLYURETHANE PREPARED THEREFROM, Interference No. 100,832, decided Oct. 27, 1982, claims 1, 4, 5 & 7.

Patent No. 4,083,955, Robert J. Grabenstetter and John A. Gray, PROCESSES AND COMPOSITIONS FOR REMINERALIZATION OF DENTAL ENAMEL, Interference No. 100,348, decided Aug. 6, 1982, claims 1, 2, 5, 6, 8–12 & 15.

Patent No. 4,087,447, Paul W. Collins and Raphael Pappo, ANTI-SECRETORY PROSTAGLANDINS INTERMEDIATES, Interference No. 100,359, decided Aug. 5, 1982, claims 1 & 2.

Patent No. 4,093,999, Paul Fuller, John B. Gillender, Michael Shacklady and Samir Basu, ELECTRONIC FRANKING MACHINES, Interference No. 100,379, decided July 30, 1982, claims 1, 2, 3, 5, 12, 13 & 22.

Patent No. 4,233,935, Tsutomu Uehara, Toshihiko Oguchi, Tsutomu Kubo and Yukio Suzuki, MAGNETIC BRUSH APPARATUS FOR ELECTROSTATIC PRINTING SYSTEM, Interference No. 100,831, decided Oct. 8, 1982, claims 1–4 & 7.

Patent No. 4,233,975, Arthur J. Yerman, ANTI-DRUG ABUSE SINGLE-USE SYRINGE, Interference No. 100,696, decided Sept. 7, 1982, claim 1.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 1, 1983

3,917,508	4,331,672	4,348,378	4,357,106
3,950,230	4,333,279	4,349,053	4,357,166
3,971,652	4,333,453	4,349,412	4,357,304
4,094,013	4,334,885	4,349,558	4,357,564
4,115,752	4,335,131	4,349,559	4,357,569
4,200,573	4,335,569	4,349,819	4,357,681
4,210,717	4,335,573	4,349,977	4,357,953
4,215,891	4,335,757	4,350,008	4,358,095
4,218,962	4,337,211	4,350,454	4,358,122
4,273,195	4,337,266	4,350,523	4,358,279
4,277,938	4,338,446	4,350,787	4,358,546
4,287,255	4,341,613	4,350,812	4,358,726
4,299,800	4,342,106	4,350,845	4,359,138
4,304,270	4,343,064	4,351,027	4,359,291
4,306,197	4,343,343	4,351,266	4,360,229
4,308,199	4,344,896	4,351,656	4,360,295
4,314,795	4,345,592	4,352,194	4,360,399
4,317,827	4,346,146	4,352,316	4,360,540
4,318,393	4,346,287	4,352,623	4,360,690
4,318,756	4,346,476	4,353,192	4,360,699
4,321,131	4,346,516	4,354,151	4,360,827
4,321,923	4,346,740	4,354,183	4,360,927
4,322,422	4,346,986	4,354,228	4,360,984
4,328,325	4,347,152	4,354,735	4,361,230
4,329,599	4,347,398	4,354,810	4,361,318
4,329,914	4,347,578	4,354,916	4,361,688
4,330,473	4,347,617	4,354,958	4,362,219
4,330,553	4,347,830	4,355,764	4,362,798
4,331,671	4,348,193	4,356,452	4,363,078

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 & 5
[Docket No. 21223-259]
Revision of Patent Procedure

AGENCY: Patent and Trademark Office, Commerce

ACTION: Final Rule.

SUMMARY: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to implement the sections of Public Law 97-247 of 1982 which become effective on February 27, 1983, and to make other miscellaneous changes. The other miscellaneous changes are being made to clarify and improve the rules where appropriate. The rulemaking also is amending Part 5 of 37 CFR to establish procedures for expediting the granting of a license under 35 U.S.C. 184 permitting the filing of a patent application in a foreign country.

EFFECTIVE DATE: February 27, 1983

FOR FURTHER INFORMATION CONTACT: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231.

SUPPLEMENTARY INFORMATION: This rule change is designed primarily to 1) implement the changes in practice in the Patent and Trademark Office provided for in Public Law 97-247 enacted on August 27, 1982; 2) clarify or rewrite certain rules; and 3) expedite the granting of licenses under 35 U.S.C. 184.

This rule change contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves.

Certain of the changes are housekeeping in nature.

A number of final rules have already been issued to implement Public Law 97-247. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on August 4, 1982, at 47 FR 33688 and on August 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on August 10, 1982, at 1021 O.G. 19-94. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on September 10, 1982 at 47 FR 40134-40140 and on September 21, 1982 at 1022 O.G. 29-46. A "Revision of Patent and Trademark Fees Confirmation" was published on September 17, 1982 at 47 FR 41272-41283 and on September 28, 1982 at 1022 O.G. 61-97. A final rule relating to the definition of "small business concern" was published on September 30, 1982 at 47 FR 43272-43276 and on October 19, 1982 at 1023 O.G. 23-29.

DISCUSSION OF SPECIFIC RULES AND SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES:

Section 1.4

Section 1.4 is amended as proposed to add a reference to Subpart D relating to citation of prior art and reexamination.

Section 1.6

Section 1.6 is amended as proposed to insert "federal" before "holidays" in paragraphs 1.6(a)-(c) in accordance with §21(b) of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.6(d) will establish in the regulations a procedure under which papers and fees which could not be filed on a particular date because of an interruption or emergency in the United States Postal Service which is so designated by the Commissioner, may be promptly filed after the ending of such a designated interruption or emergency and be considered as having been filed on that particular date. Authority for such a practice is found in §21(a) of Title 35, United States Code, as amended by Public Law 97-247.

Section 1.7

Section 1.7 is amended as proposed to insert "federal" before "holiday" in accordance with 35 U.S.C. 21(b), as amended by Public Law 97-247.

Section 1.8

Section 1.8 is amended to remove in paragraph 1.8(a) the references to §§3.55 and 4.23, which sections were removed from the rules by the rulemaking entitled "Revision of Patent and Trademark Fees" published in the Federal Register on September 10, 1982 at 47 Fed. Reg. 40134-40140. The change in paragraph 1.8(a)(i) results from the change made in §111 of Title 35, United States Code, by Public Law 97-247. Under the revised rule, the certificate of mailing procedure would be available for filing patent oaths or declarations and filing fees. However, the certificate of mailing procedure could not be used for filing patent specifications and drawings to obtain a filing date. Such papers can be filed under new §1.10. The final rule clarifies that each paper or fee filed under §1.8 must include its own certificate of mailing. The proposed amendment to §1.8(a)(viii) referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, has been adopted as a final rule as published on October 26, 1982 at 47 FR 47380-47382 and therefore is not republished here.

Section 1.10

Section 1.10 is amended as proposed to provide a procedure for assigning the date on which any paper or fee is deposited as "Express Mail" with the United States Postal Service as the filing date of the paper or fee in the Patent and Trademark Office. Authority for the Commissioner to establish such a procedure is provided in §21(a) of Title 35, United States Code, as amended by Public Law 97-247 for any paper or fee required to be filed in the Patent and Trademark Office. This procedure covers the filing of all documents, including patent and

trademark applications, and fees since they are required to be filed in the Patent and Trademark Office for processing. Questions were raised during the public hearing and in the written comments regarding the authority of the Commissioner to promulgate §1.10 insofar as it would provide for the use of "Express Mail" to file patent and trademark applications. The argument advanced was that the amendment of 35 U.S.C. 21(a) by Public Law 97-247 did not permit the Commissioner to adopt rules whereby "Express Mail" could be used to file patent and trademark applications since such applications are not papers or fees "required to be filed in the Patent and Trademark Office." It was urged that this language of 35 U.S.C. 21(a), in conjunction with amended 35 U.S.C. 111 which states that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office," prevents adoption of proposed §1.10.

The arguments presented are not supported by the legislative history or by the literal language of the statute. Section 111 of Title 35, United States Code, before and after Public Law 97-247, requires patent applications to be made "in writing to the Commissioner." This is apparent from the first sentence of 35 U.S.C. 111 which provides that "[a]pplication for patent shall be made...in writing to the Commissioner." Thus, one seeking a patent is "required" to make application for the same "in writing to the Commissioner." The written application clearly constitutes a "paper or fee required to be filed in the Patent and Trademark Office." Section 21(a) of Title 35, United States Code, authorizes the Commissioner to adopt rules whereby "any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." The authority provided by section 21(a) extends to "any paper or fee" to which the Commissioner, by an appropriate rulemaking, so extends it. The Commissioner can, therefore, by rule, establish that "any paper or fee," including a patent or trademark application, is "filed" or "received in the Patent and Trademark Office" when it is deposited with the United States Postal Service. The terms "filed" and "received" as used in 35 U.S.C. 21(a) and 111 can therefore be given the same meaning by an appropriate rulemaking by the Commissioner.

The legislative history, H.R. Rep. No. 542, 97th Cong., 2nd Sess. 8A (1982), clearly supports the interpretation set forth herein. In discussing new subsection (a) which has been added to section 21 of Title 35, United States Code, the Report emphasizes that the authority extends to "any paper or fee which is required to be filed" in the Patent and Trademark Office. The Report specifically states that the "requirements governing whether any given paper or fee may be given the filing date of the day on which it was...deposited with the United States Postal Service will be set forth in regulations established by the Commissioner." Clearly no restrictions were placed by the statute or the legislative history on the types of papers or fees which the Commissioner can consider as having been filed in the Patent and Trademark Office on the date of deposit with the United States Postal Service.

The new procedure, in paragraph 1.10(a), requires the use of the "Express Mail Post Office to Addressee" service of the United States Postal Service. This service provides for the use of a mailing label on which the Post Office clearly indicates the date on which it was deposited. Paragraph 1.10(b) requires (1) that the number of the "Express Mail" mailing label be placed on each paper or fee and (2) that a certificate of mailing by "Express Mail", signed by the person mailing the paper or fee, be included on each paper or fee and state the date of deposit as "Express Mail" in the United States Postal Service. The requirement that each paper or fee have the number of the "Express Mail" mailing label and the certificate of mailing by "Express Mail" included thereon is necessary so that the Patent and Trademark Office can verify when each paper or fee was filed if questions relating thereto arise. The number and certificate must be placed on each separate paper and each fee transmittal either directly on the document or by a separate paper firmly and securely attached thereto. It is not necessary that the number and certificate be placed on each page of a particular paper or fee transmittal. Merely placing the number and certificate in one prominent location on each separate paper or fee transmittal will be sufficient.

Under new paragraph 1.10(c), the Office will accord the paper or fee the date of deposit as "Express Mail" as the filing date without further proof unless a question is present regarding the date of mailing. If, however, more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date, or if other questions regarding the date of mailing are present, new paragraph 1.10(c) provides that the person mailing the paper or fee may be required to file (1) a copy of the "Express Mail" receipt showing the actual date of mailing and (2) a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement (oath or declaration) unless made by a person registered to practice before the Patent and Trademark Office.

The certificate of mailing procedure of §1.8(a) continues to be available in addition to the proposed procedure under §1.10. The final rule (§1.10) has been changed from that proposed to allow for a reasonable time between mailing and delivery rather than only for one day since actual delivery in one day is not always provided from all areas of the country. The final rule clarifies that each paper or fee must include its own certificate of mailing by "Express Mail." This rule is being promulgated at this time so that individuals who desire to use the service may do so after the effective date.

The "Express Mail" service is seen to be preferable to other types of postal services because a readily legible mailing date is provided to both the applicant and the Patent and Trademark Office on the "Express Mail" label. Also, the labels are of uniform size and can therefore be kept on file relatively easily by the Office, if such is determined to be necessary or desirable. Registered mail and certified mail, on the other hand, provide only a postmark for the mailing date when such mail arrives in the Patent and Trademark Office and such postmarks are

often illegible. Also, such mail arrives in various size envelopes which do not easily lend themselves to being filed so that the postmark may be retained. Administrative burdens including lack of certainty of mailing date and storage are considered greater for registered or certified mail than for "Express Mail." The Patent and Trademark Office will monitor closely the use of "Express Mail" by the public and may reconsider permitting the use of other forms of service provided by the United States Postal Service.

Section 1.17

Section 1.17, paragraph (h), is amended as proposed to remove the reference to §1.45 and add a reference to new §1.48 relating to the correction of inventorship in patent applications.

Section 1.22

Section 1.22 is amended to recognize that filing dates may be assigned without payment of the basic filing fee as authorized by §111 of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.22(b) indicates that fees paid to the Office should be itemized in such a manner that the purpose for which the payment is submitted can be clearly determined by Office personnel for proper processing. The final rule includes clarification that it refers to patent and trademark fees and charges.

Section 1.24

Section 1.24 is amended as proposed to remove the reference to coupons in denominations of forty cents since coupons in this denomination are no longer necessary.

Section 1.41

Section 1.41 is amended as proposed to require in paragraph 1.41(a) that a patent be applied for in the name of the actual inventor or inventors and that the full names of the inventors be stated. Paragraph 1.41(b), as amended, clarifies the definition of the word "applicant". New paragraph 1.41(c) permits any person authorized by the applicant to file an application for patent in order to receive a filing date on behalf of the inventor or inventors, but the oath or declaration for the application must be made by all of the actual inventors in accordance with §§1.63 and 1.64. Under new paragraph 1.41(d), a showing may be required from the person initially filing an application that the filing was authorized.

Sections 1.42 and 1.43

Sections 1.42 and 1.43 are amended as proposed to remove the requirement that the legal representative sign the application papers in view of the changes in 35 U.S.C. 111, as amended by Public Law 97-247. The oath or declaration must still be signed. Several occurrences of the masculine gender in §1.42 have been removed.

Section 1.45

Section 1.45 is amended as proposed to remove present paragraphs 1.45(b) and (c) in view of new §1.48 and remove the requirement that joint inventors sign the application papers. The joint inventors are, however, still required to make the oath or declaration in accordance with new §§1.63 and 1.64.

Section 1.46

Section 1.46 is amended as proposed, with two commas being added for clarity, to permit anyone to file the application if authorized by the inventor or inventors or one of the persons mentioned in §§1.42, 1.43, or 1.47.

Section 1.47

Section 1.47 is amended as proposed to change the reference for the rule on oaths or declarations from §1.65 to §1.63.

Section 1.48

Section 1.48 adds a new section relating to correction of inventorship as authorized by §116 of Title 35, United States Code, as amended by Public Law 97-247. Under §1.48, if the correct inventor or inventors are not named in an application for patent, the application could be amended to name only the actual inventor or inventors so long as the error in the naming of the inventor or inventors occurred without any deceptive intention on the part of the actual inventor or inventors. Section 1.48 requires that the amendment be diligently made and be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee. Correction will be permitted, if diligently requested, in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Office has the authority to substitute the true inventor for the erroneously named person. If deceptive intention was present on the part of other individuals substantively involved in the preparation or prosecution of the application their conduct will be considered and appropriate action taken under 37 CFR 1.56. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to different, but actual, joint inventors; conversions from erroneously identified joint inventors to different but actual, joint inventors; and conversions from erroneously identified joint inventors to a different, but actual, sole inventor will also be permitted. In each instance, however, the Office will have to be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name. The final rule language has been modified from that proposed to follow more precisely the language of the statute and

the legislative history by permitting correction where the error occurred without any deceptive intention on the part of the actual inventor or inventors.

Section 1.51

Section 1.51 is amended to change the reference in paragraph (a)(2) to new §1.63 for the requirements of an oath or declaration and to change paragraph (b) with regard to the required time for filing information disclosure statements. The final rule has been modified from that proposed by eliminating the word "material" before the "information disclosure statement" and the title has been changed to substitute "a complete" for "an" to be more precise.

Section 1.52

Section 1.52 is amended as proposed to revise paragraph 1.52(c) relating to interlineations, erasures, cancellations or other alterations in application papers to specify that such changes must be made before the signing of any accompanying oath or declaration and should be dated and initialed or signed by the applicant on the same sheet of paper. Paragraph 1.52(c), as amended, prohibits making alterations in the application papers after the signing of an oath or declaration referring to such application papers. Under paragraph 1.52(c), as amended, amendments to application papers made after the signing of an oath or declaration referring to the application papers can only be made in the manner provided by §§1.121 and 1.123-1.125.

Section 1.53

Section 1.53 is amended to revise the title to indicate that the section, as amended, relates to application serial numbers, filing dates and completion of applications. Paragraph 1.53(a) indicates that a serial number is assigned to any filed application for identification purposes, even if the application is incomplete or informal. Paragraph 1.53(b) provides that a filing date is assigned to an application as of the date a specification containing a description and claim and any required drawing are filed in the Patent and Trademark Office. Although the filing fee and oath or declaration can be submitted later, no amendments can be made to the specification or drawings which will introduce new matter. This practice is authorized by 35 U.S.C. 111 as amended by Public Law 97-247. New paragraph 1.53(c) provides for notifying applicant of any application incomplete because the specification or drawing is missing and giving the applicant a time period to correct any omission. If the omission is not corrected within the time period given, the application will be returned or otherwise disposed of and a handling fee of $50.00 will be retained from any refund of a filing fee. New paragraph 1.53(d) provides that, where a filing date has been assigned to a filed specification and drawing, the applicant will be notified and be given a period of time in which to file the missing fee, oath or declaration and to pay the surcharge due. The time period the Office plans to set is one month from the date of notification by the Patent and Trademark Office, but in no case less than two months after the date of

filing of the application. New paragraph 1.53(e) indicates that a patent application will not be forwarded for examination on the merits until all required parts have been received. New paragraph 1.53(f) indicates that international applications filed under the Patent Cooperation Treaty which designate the United States of America are considered to have a United States filing date under PCT Article 11(3), except as provided in 35 U.S.C. 102(e), on the date the requirements of PCT Article 11(1)(i) to (iii) are met. Paragraphs 1.53(b) and (c) have been modified from those proposed by changing the word "received" to the word "filed." The word "receipt" in paragraph 1.53(c) has also been changed to "filing". These changes have been made to ensure that the language of §1.53 cannot be considered to conflict with the use of "Express Mail" to file patent applications and obtain a filing date as of the date of deposit as "Express Mail" with the United States Postal Service.

Section 1.54

Section 1.54 is amended as proposed to designate the existing section as paragraph (a) and add a reference to §1.53. Paragraph 1.54(b) is added to indicate that applicant will be informed of the serial number and filing date of the application.

Section 1.55

Section 1.55 is amended to limit the section to claims for foreign priority by removing paragraphs (a) and (d) and redesignating paragraphs (b) and (c) as paragraphs (a) and (b). Paragraph 1.55(a) is amended to change the reference from §1.65 to new §1.63. The final rule language includes a reference to 35 U.S.C. 172 which modifies 35 U.S.C. 119 for design patents.

Section 1.56

Section 1.56 is amended to revise paragraph (c) to remove reference to signing of the application but to add reference to signing of the oath or declaration pursuant to new §1.63. Paragraph 1.56(c) has also been modified from that proposed to break it down into four items as suggested by a comment. Under paragraph 1.56(c), an application may be stricken from the files if an oath or declaration pursuant to §1.63 is signed in blank, is signed without review of the oath or declaration by the person making the oath or declaration, or is signed without the review of the specification, including the claims, as required by §1.63(b). Paragraph 1.56(c) also provides for an application to be stricken from the files if application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

Section 1.57

Section 1.57 is removed as proposed since the requirements relating to applicant's signature to the oath or declaration of the application are adequately covered in other sections.

Section 1.59

Section 1.59 is rewritten as proposed to refer to and conform with the changes proposed in §1.53.

Section 1.60

Section 1.60 is amended to require the applicant to supply a copy of the originally signed application in all cases where the §1.60 filing procedure is used. The Office will no longer prepare copies. The Office, by a separate final rule, published at 47 F.R. 47242 on October 25, 1982, has adopted a new §1.62 to provide for the filing of a file wrapper continuing application which greatly lessens the need for the Office to continue to prepare copies under §1.60. The final rule language makes clear that the statement accompanying a true copy of the parent application must be a verified statement unless made by a person registered to practice before the Office.

Section 1.62

Section 1.62 is amended to avoid inconsistency with 35 U.S.C. 111 which becomes effective on February 27, 1983. 35 U.S.C. 111 as of that date permits filing dates to be granted to patent applications without receipt of the basic filing fee, or oath or declaration. Section 1.62 is therefore being amended to permit the granting of a filing date in accordance with §111. This amendment of §1.62 is necessary to ensure compliance with 35 U.S.C. 111. The Patent and Trademark Office finds that it would be impractical not to amend §1.62 so as to grant a filing date in accordance with 35 U.S.C. 111 and not doing so might also be construed to prevent applicants from taking advantage of the provisions of 35 U.S.C. 111 authorizing the delay in the filing of the fee and oath or declaration. If §1.62 is not amended in the manner set forth in this final rule, questions may be raised as to compliance with 35 U.S.C. 111 as it will exist effective February 27, 1983. Revised paragraph 1.62(a) indicates the minimum requirements for granting of a filing date. Paragraphs 1.62(b) and (c) cover the filing fee and oath or declaration requirements, respectively. Paragraph 1.62(d) relates to later filing of the filing fee or oath or declaration as provided for in 35 U.S.C. 111. Paragraphs 1.62(e)-(i) are identical to former paragraphs 1.62(b)-(f).

Section 1.63

Section 1.63 is added to replace §1.65 relating to the required content and execution of an oath or declaration filed as a part of a patent application and is intended to state the minimum contents thereof. An applicant may, if desired, choose to include one or more additional averments in the oath or declaration such as, for example, stating that the patent is not barred under the provisions of 35 U.S.C. 102. Paragraph 1.63(a) provides that the oath or declaration, (1) be executed in accordance with §1.66 or §1.68, (2) identify the specification to which it is directed in some definite manner such as giving the title of the invention or serial number of the application, if previously filed, (3) identify each inventor and his or her residence and country of citizenship, and (4) state whether the inventor is a sole or joint inventor of the claimed invention.

Paragraph 1.63(b) further requires the oath or declaration to state that the person signing the oath or declaration (1) has reviewed and understands the contents of the identified specification, (2) believes the named inventor is the original and first inventor, and (3) acknowledges the duty to disclose information which is material. While paragraph 1.63(b) requires the person signing the oath or declaration to review and understand the specification including the claims, it is not intended to require that such person be skilled in patent law so as to grasp the legal implications of claim language and drafting. The person must recognize, however, that what is being claimed is the subject matter which that person regards as his or her invention pursuant to 35 U.S.C. 112.

Paragraph 1.63(c) requires that any application in which a claim for foreign priority is made identify in the oath or declaration the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed.

Paragraph 1.63(d) requires that the oath or declaration in a continuation-in-part application, which discloses and claims subject matter in addition to that disclosed in the prior copending application, state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the parent application and the national or PCT international filing date of the continuation-in-part application. This latter requirement is not new, but is included to serve as a reminder to the person making the oath or declaration of this duty to disclose material information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the continuation-in-part application. For example, in circumstances where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120, the duty to disclose extends to any material information, as defined in §1.56(a) measured from the filing date of the continuation-in-part application. This would include the first foreign patenting, and any foreign patenting subsequent to the first which materially differs therefrom, of the subject matter of the parent application which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application. Any publication of the parent application, other than foreign patenting, or any public use or sale in the United States of the subject matter of the prior application, which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application, would also come within §1.56(a) in such circumstances. See In re Ruscetta and Jenny, 118 U.S.P.Q. 101 (C.C.P.A. 1958); In re van Langenhoven, 458 F. 2d 132, 173 U.S.P.Q. 426 (C.C.P.A. 1972), and Chromalloy American Corp. v. Alloy Surfaces, Co., Inc., 339 F. Supp. 859, 173 U.S.P.Q. 295 (Del. 1972).

Section 1.64

Section 1.64 is added as proposed to clearly indicate who must sign the oath or declaration of a patent application.

Section 1.65

Section 1.65 is removed as proposed because the oath or declaration requirements set forth therein are covered by new §1.63.

Section 1.67

Section 1.67 is amended as proposed to remove all of paragraphs (a) and (b) and substitute therefor new wording. Paragraph 1.67(a) indicates that a supplemental oath or declaration meeting the requirements of new §1.63 may be required to correct deficiencies or inaccuracies present in an earlier oath or declaration. Paragraph 1.67(b) requires a supplemental oath or declaration to be filed (1) when a claim is presented embracing material not originally claimed and (2) when a subsequently filed oath or declaration under §1.53(d) refers to an amendment which includes improper new matter. Paragraph 1.67(b) also clearly states the prohibition against entry of new matter after the filing date of the application.

Section 1.69

Section 1.69, paragraph (b), is amended as proposed to change the time at which a translation of a non-English language oath or declaration which has not been supplied by the Office must be filed. The time period for filing the translation is changed to two months after notification that a translation is required. The reference to §1.65 in paragraph 1.69(b) is changed to §1.63.

Section 1.70

Section 1.70 is amended to refer to §1.63 for the requirements to be met when an oath or declaration is filed under 35 U.S.C. 371(c)(4). The wording of the title in the final rule is changed to reflect more clearly the subject matter of the rule.

Section 1.77

Section 1.77 is amended as proposed to change paragraphs (h) and (i) to refer to the abstract of the disclosure and signed oath or declaration, respectively.

Section 1.97

Section 1.97 is amended to change the title from "prior art statement" to "information disclosure statement". This change is appropriate since the designation "information disclosure statement" more accurately characterizes the nature and content of the information which may be included in such a statement. Information which is required to be submitted pursuant to §1.56 may ultimately be determined not to be "prior art," but nevertheless may be "material" pursuant to §1.56. Section 1.97

has also been modified from that proposed by eliminating the word "material" since information submitted pursuant to §1.97 may be considered to be of questionable materiality or may be determined, upon examination, not to be "material". Section 1.97 now provides that an information disclosure statement should be filed with the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. Paragraph 1.97(b) has been amended in recognition that applicant may choose to furnish other material information in another manner or statement. Paragraph 1.97(b) now also refers to section 1.56(a) for the definition of "material information". The amendments to paragraph 1.97(b) do not in any manner reduce the obligation to submit material information as defined in §1.56(a).

Section 1.98

Section 1.98 indicates that information disclosure statements should list prior art with all of the information which is required to print such citations on the front page of a patent. The final rule states clearly that the publication date indicated on the document should be submitted. This will not serve to preclude a showing of a different, actual publication date. Another purpose of the citation requirements in this section is to permit ready reference to the document from its citation.

Section 1.99

Section 1.99 is amended to change the title to be consistent with the amendment to §1.97.

Section 1.101

Section 1.101 is amended to indicate specifically that applications which are to have their examination advanced pursuant to §1.102 will be taken up for examination out of order by the examiner. The final rule is also modified to set out when international applications which have complied with the requirements of 35 U.S.C. 371(c) are taken up for action.

Section 1.118

Section 1.118 is amended as proposed to designate the previous section as new paragraph (a) and amend it to clearly state that no new matter may be introduced into an application and to make specific reference to §§1.53, 1.63 and 1.67. New paragraph 1.118(b) indicates how improper amendments which introduce new matter in the specification or claims will be handled by the examiner.

Section 1.123

Section 1.123 is amended to require all corrections to drawings to be made by bonded draftsmen at applicant's expense since the Office does not have sufficient draftsmen to make such corrections. Sketches of any desired corrections will, however, still require approval of the examiner. The final rule makes

clear that changes in the drawing may be made by submission of substitute drawings.

Section 1.125

Section 1.125 is amended to relax the prohibition against substitute specifications which are not required by the examiner. The section, however, adds the requirement that any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Under the section the statement must be a verified statement if made by a person not registered to practice before the Office. The final rule specifies that a substitute specification may not be accepted unless it is clear to the examiner that processing of the application would be facilitated thereby.

Section 1.131

Section 1.131 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent as long as the patent upon which the rejection is based does not claim the rejected invention. Section 1.131 cannot be used to overcome a rejection based upon a United States patent claiming the rejected invention. This is true regardless of whether the rejected claims are contained in an application being examined or a patent being reexamined. Section 1.131 is inapplicable if the same invention is being claimed by the United States patent upon which the rejection is based. Under the section as amended, the same person or persons who would make the affidavit or declaration in an application will be required to make the affidavit or declaration on behalf of the owner of the patent under reexamination.

Section 1.132

Section 1.132 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent.

Section 1.137

Section 1.137 is amended as proposed to except from the provisions of paragraph (b) those applications abandoned pursuant to §1.53(d) because the fee, oath, or declaration and the surcharge were not submitted. Section 111 of Title 35, United States Code, as amended by Public Law 97-247, requires that any delay in submission of the fee and oath be shown to be unavoidable. Thus, paragraph (b) of §1.137 permitting revival where abandonment was unintentional is inapplicable to the revival of applications which become abandoned pursuant to §1.53(d).

Section 1.141

The proposed amendments to §1.141 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 1.153

Section 1.153 is amended to change the reference for oath and declaration requirements from §1.65 to §1.63 and to conform the language of the rule to be consistent therewith.

Section 1.154

Section 1.154 is amended as proposed to revise paragraph (e) to refer to the signed oath or declaration requirements of §1.153(b).

Section 1.162

Section 1.162 is amended as proposed to change the reference from §1.65 to §1.63.

Section 1.163

Section 1.163 is amended as proposed to change the wording of the section to clearly indicate that a signed oath or declaration is required rather than a signed specification.

Section 1.172

Section 1.172 is amended to indicate clearly that the reissue oath is signed and sworn to rather than the reissue application. The final rule has been modified from that proposed by referring to a "reissue oath" rather than to "reissue oaths."

Section 1.174

Section 1.174 is amended as proposed to remove the requirement that photoprints of original drawings be securely mounted or pasted on sheets of drawing board because paper drawings are acceptable.

Section 1.175

Section 1.175 is amended as proposed to change the reference to the oath or declaration from §1.65 to §1.63.

Sections 1.301, 1.302 and 1.303

The proposed amendments to sections 1.301, 1.302 and 1.303, referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, have been adopted as final rules as published on October 26, 1982 at 47 FR 47380-47382 and corrected on November 5, 1982 at 47 FR 50142 and therefore are not republished here.

Section 1.324

Section 1.324 is amended to include wording similar to that in §1.48 for correction of inventorship in applications.

Section 1.325

Section 1.325 is amended as proposed to include reference to the reexamination procedure.

Section 1.335

Section 1.335 is added as proposed to provide a new section relating to the filing in the Patent and Trademark Office of notices of arbitration awards. Such filing is required under §294 of Title 35, United States Code, as added by Public Law 97-247. The final rule has also been modified in response to a comment to indicate that the notices of arbitration awards are intended to be placed in the patent files.

Section 1.565

The proposed amendments to §1.565 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 5.12

Section 5.12 is amended as proposed to separate the section into two paragraphs. Paragraph (a) provides that the filing of an application for an invention made in the United States is considered to include a petition for a license for foreign filing. If a license is granted, it will be indicated on the filing receipt. If it is not granted, no indication of the denial will appear. Failure to grant a license should be considered a denial of a first petition for a license. A subsequent petition may be filed under §5.12(b). Section 5.12(b) is essentially the text of §5.12 in its previous form. No rights to file a petition for license are being removed.

Withdrawal Of Proposed Amendments To Sections 1.141 and 1.565.

A number of the speakers at the public hearing held on December 16, 1982, urged that the amendments to §§1.141 and 1.565 be deferred or dropped pending further study. Those urging that the proposed amendments to §1.141 not be adopted at this time included speakers from the American Patent Law Association, from Committee 103 of the American Bar Associations's Patent, Trademark & Copyright Section, and from the Bar Association of the District of Columbia. The Boston Patent Law Association urged that the amendment to §1.565 be removed or held in abeyance. The American Patent Law Association indicated that more time was needed for its committees to analyze the issues in the proposed amendments to §§1.141 and 1.565.

In response to the recommendations received at the public hearing, the proposed amendments to §§1.141 and 1.565 are being withdrawn at this time to permit the public to study the issues involved and make any further recommendations considered appropriate. Pending the further study referred to by the speakers at the hearing and consideration of any recommendations resulting therefrom, the Office will continue to operate under present §§1.141 and 1.565 as interpreted by the Manual of Patent Examining Procedure and relevant Patent and Trademark Office and judicial precedents.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Forty-eight letters presenting written comments were received and seven persons testified at the public hearing on December 16, 1982.

Comments appear below along with responses thereto.

Comment:

One comment objected to inadequate notice regarding these proposed rule changes.

Reply:

The proposed rules notice was published in the Federal Register on October 27, 1982. This is more than seven weeks prior to the date of the hearing and four months prior to the effective date of the final rules. Such periods are considered to be reasonable in view of the fact that the legislation requiring the rule changes was only enacted on August 27, 1982 and that other rule changes were required to be implemented by October 1, 1982.

Comment:

One comment proposed that "Patent and Trademark Office" should be used in the rules rather than merely "Office".

Reply:

The proposal has been adopted in the final rules in those locations where confusion may otherwise result.

Comment:

Five comments requested that promulgation of §§1.10, 1.63, 1.97, 1.141 and 1.565(e) be delayed and the period for comment extended until March 30, 1983.

Reply:

Amendments to §§1.141 and 1.565 are not being promulgated at this time to provide time for further consideration and study as requested. If after study, a rule change is felt desirable, a new proposal will be issued. New §1.10 is being promulgated to make it available to applicants as it was intended in the statute. New §1.63 is being added and §1.65 deleted to reduce the formal statements required. If desired, the old oath and declaration forms may continue to be used if the statement is included that applicant "has reviewed and understands the contents of the specification, including the claims". For continuation-in-part applications, it is necessary to also include language is conformance with §1.63(d). Section 1.97 is

being promulgated to remove problems relating to the time period in the current wording and to clarify the section in general.

Comment:

One person questioned why Sunday was not mentioned in §1.6(b) or (c).

Reply:

Section 1.6(b) and (c) are limited to weekdays which by definition excludes Sunday.

Comment:

Two comments were received which proposed that only a certificate of mailing procedure as in §1.8(a) be used for determining the date of deposit under 35 U.S.C. 21.

Reply:

The filing date of an application is considered to be much more critical than the filing dates of papers accepted under §1.8. The application filing date is often critical for determining if a statutory bar exists, whether foreign priority can be claimed and who is the senior party in an interference. Therefore, papers filed for purposes of receiving an application filing date should have some clear indication of the date of receipt by the United States Postal Service. Such a practice would also probably require storing all of the envelopes in the file wrapper for record purposes.

Comment:

Three comments were received which stated that private courier services should also be provided for in §1.10.

Reply:

Section 21(a) as amended by Public Law 97-247 provides for filing dates being given only when "deposited with the United States Postal Service." Although private courier services may be used to deliver papers to the Patent and Trademark Office, the actual date of receipt by the Patent and Trademark Office will be considered to be the filing date.

Comment:

A comment was received which argued that the Post Office date stamp should be stamped on the mailing label instead of having to enter the label number on each document.

Reply:

Stamping the mailing label would not add anything since the postal clerk receiving the "Express Mail" must already indicate the date and time of deposit and initial the label. A purpose of placing the label number on each paper is to permit several

papers to be placed in a single envelope. The mailing labels may be retained in the Patent and Trademark Office for later verification.

Comment:

Seven comments were received that the requirement that the item be received the following day (§1.10(b)) was unnecessarily restrictive.

Reply:

Section 1.10 does not require that the item be received the next day in the Patent and Trademark Office in order to receive the date of deposit as the mailing date. The one day reference has been deleted. Further proof of mailing may be required where an unreasonable period of time is involved and supporting evidence is not otherwise available to the Patent and Trademark Office. Documents deposited with the United States Postal Service will be given a filing date which corresponds to the date of receipt indicated by the postal clerk on the "Express Mail" mailing label.

Comment:

Four comments indicated that §1.10 does not assist in placing applicants and attorneys outside the Washington area on the same footing as those in Washington.

Reply:

The main purpose of §1.10 is to implement 35 U.S.C. 21(a) in a manner which would provide for granting filing dates for papers and fees as of the date of their deposit with the United States Postal Service. Certainly these provisions using "Express Mail," together with the certificate of mailing procedure available under §1.8, will go a long way in reducing last minute deliveries to the Patent and Trademark Office by persons outside the Washington area.

Comment:

Two comments stated that the comments accompanying §1.10(c) should be clarified to explain the meaning of "more than one day."

Reply:

The final rule has been clarified.

Comment:

It was proposed by one person that the "affidavit or declaration" under §1.10(c) be waived if the statement is made by a registered attorney or agent.

Reply:

The suggestion has been adopted.

Comment:

It was indicated by one person that certified mail provides proof of mailing date under §1.10 by virtue of the Post Office stamp on the certified mail receipt card.

Reply:

The information on the certified mail receipt card is of no benefit to the Patent and Trademark Office since it is immediately returned to the sender. The Patent and Trademark Office would not be able to retain any information which gives proof of the date of mailing.

Comment:

Three comments raised questions as to the need to make the acceptance of the "Express Mail" contingent upon the performance of the Post Office in §1.10(c).

Reply:

The acceptance of the "Express Mail" is not contingent upon "next day delivery". The reference in §1.10(c) to proof of mailing merely provides a basis for the Office requiring proof of mailing where an explanation appears to be necessary to clarify the record. Such information is expected to be required only in a few instances. The rule has also been revised to clarify this matter.

Comment:

Five persons suggested the use of registered or certified U.S. mail for obtaining filing dates under 35 U.S.C. 21.

Reply:

Registered mail does not provide any information or evidence to the Patent and Trademark Office as to the date of mailing other than the postmark, which is often unreadable. Storage of envelopes containing such postmarks is also burdensome. The deficiency of certified mail has already been discussed.

Comment:

One person questioned what treatment will be accorded a paper placed in an "Express Mail" box receptacle after the box has been cleared for the last time on a given day.

Reply:

The paper will be considered to be deposited as of the date of receipt indicated on the "Express Mail" mailing label by the Postal Service clerk.

Comment:

One person commented that he found the idea of using a declaration or affidavit to establish a date of deposit unacceptable because it exposes the integrity of the assignment of filing dates to the risk of deception.

Reply:

The use of declarations or affidavits is usually intended to help explain activities which can be supported by exhibits. For example, if the Office copy of the mailing label was not entirely readable, applicant's copy of the "Express Mail" mailing label could accompany a declaration and serve as the basis for granting a filing date.

Comment:

Three persons objected to permitting only the individual who places the correspondence in an "Express Mail" facility to execute the certificate of express mailing under §1.10(c).

Reply:

The wording of §1.10(c) differs from §1.8 because the documents which are expected to be filed under §1.10 are patent and trademark applications. The filing dates of such documents are very important and should therefore be based on personal knowledge.

Comment:

One comment was received which suggested that §1.10 be adopted with an effective date retroactive to a year earlier.

Reply:

Such an earlier date is not possible since the statutory authority for §1.10 does not come into effect until February 27, 1983.

Comment:

One comment proposed designating the Patent and Trademark Office as an "Express Mail" Post Office to make lower rates available.

Reply:

Such a designation is not possible.

Comment:

One person requested that the Patent and Trademark Office publish a form of certificate of mailing by "Express Mail" suitable for purposes of §1.10(b).

Reply

A suggested form is included in the preamble of this rule change.

Comment:

One comment proposed that §1.10(c) clearly state what evidence will be necessary and sufficient to prove a filing date by mailing.

Reply:

A specific answer cannot be given since it is dependent upon the particular fact situation and what evidence is actually available.

Comment:

Two comments questioned whether P.L. 97-247 authorized a rule such as §1.10 granting filing dates as of the mailing date.

Reply:

The question raised by this comment has been treated in the discussion of §1.10 supra.

Comment:

One comment proposed that §1.10 be corrected to read --Any paper or fee required to be filed-- to more closely conform with 35 U.S.C. 21(a).

Reply:

No need is seen to change §1.10 as suggested since, if a patent is desired, it is "required" that each paper relating to an application be filed in the Patent and Trademark Office.

Comment:

One comment indicated that the requirement to place the "Express Mail" label number on each paper and fee is not realistic.

Reply:

The placement of the label number on each paper or fee allows later verification of the mailing dates of all different papers mailed in one envelope and is not seen to be overly burdensome.

Comment:

A question was raised as to whether the "Express Mail" label number should be placed on every page.

Reply:

The label number need not be placed on each page. It should, however, be placed on the first page of each separate document, such as, a new application, amendment, assignment, and transmittal letter for a fee, along with the certificate of mailing by "Express Mail". Although the label number may be on checks, such a practice is not required.

Comment:

A question was raised by one party as to the location within the Patent and Trademark Office of the mailing labels where papers to different applications are placed in the same envelope.

Reply:

The mailing labels from all "Express Mail" packages are expected to be removed and initially retained centrally in the Mail Room of the Patent and Trademark Office. The number on each document will allow direct access to the appropriate mailing label if any questions should arise.

Comment:

One comment suggested that §1.22(b) be amended to exclude itemization of all fees where a general authorization to charge a deposit account has been given.

Reply:

Even where fees are charged to a deposit account, it is desirable to know specifically which fees are to be paid. Therefore, the suggestion has not been adopted.

Comment:

One comment was received which suggested adding a sentence to §1.41(d) indicating that the filing of an oath or declaration executed by the applicant would constitute proof of authority to file the application.

Reply:

Such an additional sentence is not considered to be necessary since the Patent and Trademark Office does not intend to utilize the provisions of §1.41(d) unless a controversy arises.

Comment:

One comment was received which suggested the addition to the end of §1.42 of the words "except for patents granted to the assignee either of the inventor or of the legal representative of the inventor."

Reply:

No change is considered to be necessary since few, if any, problems have arisen without such additional wording in the past. The existing rule wording "upon proper intervention" also provides protection for assignees.

Comment:

One comment was received which indicated that §1.46 does not clearly authorize an assignee of a part interest to cause an application to be placed on file.

Reply:

Although §1.46 may not make this point clear, it is clear from §1.41(c).

Comment:

One comment recommended that the requirement to show diligence in correcting inventorship under §1.48 be deleted.

Reply:

It is felt that corrections of inventorship should be diligently made in patent applications. The naming of correct inventorship is necessary for the Patent and Trademark Office to make decisions on topics such as double patenting, priority claims and first inventorship.

Comment:

It was recommended in one comment that the verified statement of facts required by §1.48 "by the original named inventor or inventors" be replaced by a requirement that he or they merely assent to the statement of the facts since others may be better able to provide the best evidence.

Reply:

Since it is the original inventorship that is being changed, it is believed that all of the previously named inventors should positively indicate their agreement with the facts in the case. Affidavits by other individuals may also be supplied where such persons have direct personal knowledge of certain aspects of the case.

Comment:

One comment indicated that "it seems a reasonable presumption that if ownership is unaffected, deceptive intent is absent" in a §1.48 correction of inventorship situation and that such a presumption could be written into the rules.

Reply:

Even if applications are commonly owned, the wrong inventorship could be deceptively named to obtain rights which are only available to the same inventive entities. The report on Public Law 97-247 also states that "the Commissioner must be assured of the presence of innocent error, without deceptive intention --- " before permitting a substitution of a true inventor's name.

Comment:

One person suggested that the deceptive intent in §1.48 refer to the acts of the actual inventors rather than to both the alleged and actual inventor or inventors.

Reply:

This suggestion has been adopted in both §§1.48 and 1.324, but deceptive intention on the part of other parties is subject to review under §1.56.

Comment:

One person suggested that in §1.48, line 3 "may" be changed to --must--.

Reply:

The suggestion has not been adopted. Corrections may only be made if the conditions set forth in §1.48 are satisfied.

Comment:

Two comments objected to the insertion of "material" in §1.51(b).

Reply:

This word has been removed and does not appear in the final rule.

Comment:

One comment suggested changing "an" to --a complete-- in the title of §1.51.

Reply:

This suggestion has been adopted.

Comment:

One comment indicated that §§1.52(c) and 1.56(c) seemed overly inflexible and harsh when considering minor grammatical changes.

Reply:

Although §1.56 indicates that applications "may" be stricken, rather than "must" be stricken, it is still considered important to maintain a clear line in the regulations against changes in the original applications made after the execution of the application oath or declaration. The line between grammatical changes and changes relating to the merits is frequently unclear.

Comment:

Three comments noted an apparent inconsistency between proposed §§1.10 and 1.53 as to whether §1.10 relates to the filing of patent applications.

Reply:

Section 1.10 does relate to the filing of patent applications. In order to clarify the wording, "received" in §1.53(b) has been changed to "filed".

Comment:

One comment was received suggesting that a sentence be added to §1.53(d) to indicate that PCT applicants cannot submit late filing fees, oaths or declarations under 35 U.S.C. 371.

Reply:

Such a reference in §1.53 does not appear appropriate because this section relates to "filing dates". In the PCT situation, the filing date was already granted at the time of filing the PCT international application.

Comment:

One comment was received which suggested that §1.53(a) be rewritten to indicate all applications are assigned serial numbers but not accorded filing dates.

Reply:

The proposal was not adopted since it is considered unnecessary.

Comment:

One person suggested that §1.53(b) be amended to specify that only "a specification purporting to contain a description and at least one claim..." is needed to obtain a filing date.

Reply:

No change is being made since a determination must be initially made as to whether or not a specification has been filed. In any case, sufficiency of the specification must later be checked by the examiner.

Comment:

One person indicated that the time period for filing a correction to a defect in an application is left entirely within the discretion of the Commissioner and that any setting of periods of time would be tantamount to an exercise of rulemaking authority. Section 1.53(d) should be provided with an explicit time limitation.

Reply:

No specific time period is considered to be necessary in the regulations. The Commissioner has full authority and discretion under the statute in 35 U.S.C. 111 to set periods of time. The statute does not require the Commissioner to use the rulemaking process to set time periods for response to an action or requirement by the Patent and Trademark Office in a patent application.

Comment:

Two comments were received objecting to the use of the words "or otherwise disposed of" in §1.53(c).

Reply:

This wording has existed in §1.53(b) in the past without objection. No need is seen to depart from this wording at this time.

Comment:

One person questioned whether the change in §1.54(b) would result in return post cards not being stamped with the application serial number.

Reply:

No change is intended in the existing return post card practice.

Comment:

One comment proposed adding another sentence to §1.154(b) indicating that foreign priority claims will be acknowledged on the filing receipt.

Reply:

This proposal is not being adopted since the examiner must determine whether the stautory requirements of 35 U.S.C. 119 have been met before an acknowledgment can be sent.

Comment:

One comment suggested that the Patent and Trademark Office indicate on the filing receipt both the filing date under §1.10 and the actual date of receipt.

Reply:

The actual date of receipt can be obtained by requesting a receipt from the Postal Service. The actual date of receipt cannot be placed on the filing receipt because of current computer limitations. The suggestion is therefore not being adopted at this time.

Comment:

One comment was received indicating that it is not clear whether or not an application based on a specification and drawing, but containing no oath or declaration or filing fee, could serve as the basis for a priority claim under 35 U.S.C. 120.

Reply:

If the filed specification and drawings fully disclose the invention as required by 35 U.S.C. 112, the application may serve as a basis for a priority claim under §120 even if no oath or declaration, or no fee has been filed, as long as the continuing application is filed prior to the abandonment of the first application under §1.53(d).

Comment:

One comment suggested that §1.55(b) be removed since the requirements of the statute are fully set forth in 35 U.S.C. 119.

Reply:

Although the statutory requirements set forth basic requirements, it is felt that the more specific details of §1.55(b) provide needed guidance for applicants.

Comment:

Two persons questioned the meaning of "inspection and review" in §1.56(c) and suggested certain amendments.

Reply:

The words "inspection and" are being removed to eliminate any redundancy. The paragraph has also been broken down into four items as proposed by a comment.

Comment:

One suggestion was made that applicant be allowed to order a copy of the parent patent, with payment of fee, when filing a §1.60 application.

Reply:

Such a practice is contrary to the intent of the rule change. The problems the Patent and Trademark Office is attempting to solve by the change, which are caused by poor copies and delays in processing, would remain with such a practice.

Comment:

Two persons suggested that §1.60 be amended to drop "and claimed" from the title.

Reply:

The suggestion has been adopted.

Comment:

One person suggested that §1.60 be modified to drop the requirement for verification by affidavit when the statement is made by a registered patent attorney or agent.

Reply:

The suggestion has been adopted.

Comment:

One comment noted that there is no specific requirement in §§1.56, 1.63 or 1.98 to identify foreign applications filed more than one year prior to the U.S. filing date.

Reply:

Section 1.63(b)(3) broadly requires applicant to acknowledge the duty to disclose information material to the examination of the application. This information includes foreign patents based on applications filed more than a year prior to the filing date of the United States application and which issue before the filing date of the United States application.

Comment:

One person felt that §1.63(b)(1) will be a disaster for the patent system since the inventor may not be physically able to review and understand the invention or because the legal language format used in claims may not be understood by the inventor. Five persons argued that adoption of §1.63 would result in raising the defense that the inventor did not understand the claims in each patent infringement suit.

Reply:

The inventor is not expected to understand all the legal interpretations or limitations in a claim. The inventor is expected to recognize that what is being claimed is the subject matter which the inventor regards as his or her invention pursuant to 35 U.S.C. 112. The physical factors have to some extent existed in past practice and have been handled on a case-by-case basis where necessary. The situation outlined would exist in any signing of a legal document. The wording of §1.63 has been explained in the preamble to minimize occurrences of problems.

Comment:

One comment noted that many inventors do not know whether additional subject matter is claimed in a continuation-in-part application under §1.63(d).

Reply:

The wording in §1.63(d) is considered to be appropriate and in accordance with case law. If uncertainty exists the attorney or agent, if any, should clarify the matter and §1.63(d) should be followed.

Comment:

One person proposed that §1.63(d) be modified to explicitly require the disclosure of foreign patents granted before the filing of the continuation-in-part application.

Reply:

Section 1.63(d) has been amended to clearly indicate that material information pursuant to §1.56(a) between the filing date of the parent application and the filing date of the continuation-in-part application must be disclosed. The discussion of new §1.63 refers to material foreign patents published during this time interval.

Comment:

Two comments indicated concern with the parenthetical language in proposed §1.63(d) in that it would create severe problems.

Reply:

Paragraph (d) of §1.63 has been amended to remove such problems.

Comment:

One comment suggested adding --he or she is aware of-- after information in §1.63(b)(3) and (d).

Reply:

This suggestion is not adopted since such wording is already present in §1.56(a).

Comment:

One comment suggested that §1.63(c) clarify what is intended by "the first filed foreign application," particularly in view of 35 U.S.C. 119, third paragraph.

Reply:

The rule has been amended to clarify the matter.

Comment:

One comment was received suggesting changes be made in the title and that paragraph (b) of §1.70 refer to §1.63 instead of "this section."

Reply:

The change suggested to the title has been made. The suggestion to paragraph (b) has not been made since it is considered unnecessary.

Comment:

Three comments were received which indicated that the wording of §1.97(a) would require an immediate filing of disclosure information if the filing receipt is received just before three months after filing.

Reply:

The wording of §1.97(a) has been changed to remove this problem.

Comment:

One comment was received which urged that the title of §1.97 and contents of §1.97(b) not be changed, since the proposed wording would not require filing of the closest prior art.

Reply:

The proposed changes are not intended to make any changes in the type of information which is to be submitted to the Office. The proposal has been adopted in modified form.

Comment:

One person indicated preference for the use of "prior art" in §§1.51(b), 1.97, 1.98, and 1.99 since it does not create an inferred admission that the information submitted is material. Five comments favored the removal of "prior art" from §1.97 but objected to the addition of "material".

Reply:

The rule change was proposed to answer arguments that the use of the term "prior art" implied that the information was a reference against applicant's invention. Since the majority of the comments supported modifying the rule, the use of the terms "prior art" as well as "material" are being dropped.

Comment:

Two comments were received concerning §1.98(a) suggesting that the "place of publication" be clarified or removed.

Reply:

This suggestion has not been adopted since the "place of publication" is not mandatory. It is intended to mean the city and country of publication. Also the citation of the "place of publication" is consistent with the §1.107(a) requirements.

Comment:

It was suggested by one person that §1.101 be amended to clarify when PCT international applications which have entered the national stage should be taken up for examination.

Reply:

An amendment has been made to §1.101 as suggested to clarify that they are taken up in order based on the date they have entered the national stage by compliance with the requirements of 35 U.S.C. 371(c).

Comment:

One comment was presented suggesting that the words "which are not examined on the merits" in §1.101 be removed.

Reply:

The suggestion has been adopted.

Comment:

One comment urged returning to the use of the Office draftsmen for minor corrections to reduce the burden under proposed §1.123.

Reply:

Some minor corrections may be made by the Office draftsmen on a time-available basis. However, since the Office currently has only a few draftsmen who are responsible for reviewing and approving all drawings, very little time is presently available for making corrections.

Comment:

Four suggestions were made to amend §1.123 to specifically provide for the filing of substitute drawings if corrections are required.

Reply:

These suggestions have been adopted.

Comment:

One comment was received indicating that §1.125 should indicate to whom it should be clear that acceptance of a substitute specification would facilitate processing.

Reply:

An amendment has been made to clarify that it should be clear to the examiner.

Comment:

One comment suggested removal of the last sentence of §1.137(b) to permit §1.183 petitions to be filed to waive time periods for requesting revival of unintentionally abandoned applications.

Reply:

No change in §1.137(b) is considered to be appropriate at this time since §1.137(b) only became effective on October 1, 1982.

(Since changes to §1.141 are not being promulgated in this rule change, comments and replies to this section are not included.)

Comment:

One comment pointed out that the reference to a "period of twelve months" in §1.153 was indefinite.

Reply:

Section 1.153 has been amended to remove the indefiniteness.

Comment:

One comment was presented which suggested that §1.172 refer to a "reissue oath" rather than to "reissue oaths."

Reply:

This suggestion has been adopted.

Comment:

One comment suggested the insertion of "the filing of" before "each patent" in §1.335(a) and (b).

Reply:

The suggestion has been adopted.

(Since the proposed addition of a new paragraph (e) to §1.565 is not being adopted in this rule change, comments and replies to this section are not included.)

Comment:

One suggestion was made that a procedure be designed in which foreign filing licenses could be granted by return post card without losing the time required to send the filing receipts.

Reply:

It is felt that the procedure under §5.12 should be adopted at this time and be placed into operation. If after some experience additional modifications are found desirable, further changes could be made. To introduce several alternative procedures at this time is considered to be too complex and may endanger the success of the proposed procedure.

Comment:

One comment requested that the Office grant a prospective foreign filing license under §5.12 for all data and amendatory material to be filed abroad.

Reply:

Such petitions are not part of this proposed change but this concept is being considered in a separate rule change proposal.

Comment:

One comment suggested that the Filing Receipt specifically indicate whether or not a license has been denied under §5.12.

Reply:

The proposed practice under §5.12 would indicate on the Filing Receipt when a license is granted. On other cases in which a license is not granted further review is required. A license may still be granted at a later date.

Comment:

One comment stated that it should be possible to petition at any early date for a foreign filing license as well as obtain one on the filing receipt.

Reply:

It will still be possible to petition earlier for a license under revised §5.12.

Implementation Of Patent Procedure Revisions

The effective date of the patent procedure revisions contained in this rulemaking is February 27, 1983. The various sections will be implemented in the manner set forth below:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

The "Guidelines under §1.10" set forth below provide guidance in implementing §1.10:

Guidelines under §1.10

A) The certification under §1.10 requires a signature of the person depositing the paper with the United States Postal Service as "Express Mail". Specifically, if the certification under §1.10 appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification under §1.10.

B) When possible, the certification under §1.10 should appear on an upper portion of the first page of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO-85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper or fee it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., complete application, specification and drawings, responses to rejection or refusal, notice of appeal, etc. If the serial number of the application is not known, the identification should include at least the name of the inventor(s) and the title of the invention. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable

if there is any question or doubt concerning the connection between the sheet and the paper filed.

D) In situations wherein the correspondence includes papers for more than one application e.g., a single envelope containing separate applications or papers for various parts of the Patent and Trademark Office, each paper must have its own certification and the "Express Mail" label number as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a notice of appeal), each paper should also have its own certification as a part thereof or attached thereto.

F) Practitioners may place the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

"Express Mail" mailing label number _____
Date of Deposit _____

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

_____
(Typed or printed name of person mailing paper or fee)

_____
(Signature of person mailing paper or fee)

§1.48 Correction of inventorship.

Any patent application pending on or after February 27, 1983, is subject to the provisions of this section.

§1.53 Serial number, filing date, and completion of application.

The provisions of this section apply to any patent application filed on or after February 27, 1983.

§1.63 Oath or declaration.

The provisions of §1.63 will become effective on February 27, 1983, and will apply to any oath or declaration filed on or after that date. However, in order to provide a smooth transition from the old oath or declaration requirements to the new, the Office will continue to accept between February 27, 1983, and June 30, 1983, any oath or declaration in compliance with §1.65 as it existed immediately prior to February 27, 1983, so long as that oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective July 1, 1983, all oaths or declarations filed under §1.51(a)(2) as a part of a patent application must fully comply with §1.63.

A suggested format for a declaration is set forth below:

Declaration For Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

_____,

the specification of which

(check one) ☐ is attached hereto.

☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor _____

Inventor's signature _____ _____
Date

Residence _____

Citizenship _____

Post Office Address _____

_____

Full name of second joint inventor, if any _____

Second Inventor's signature _____ _____
Date

Residence _____

Citizenship _____

Post Office Address _____

_____

(Supply similar information and signature for third and subsequent joint inventors.)

The declaration form set forth above is specifically designed for use where the specification is attached to the form and the specification and declaration are filed at one time, and also where the declaration form is filed after the specification and

drawings in accordance with §1.53. The form can be used where foreign priority is claimed under 35 U.S.C. 119 and where the benefit of one or more United States applications is claimed under 35 U.S.C. 120. Appropriate modifications can be made in the form so long as compliance with the rules is maintained. For example, if the form is being used as a supplemental declaration form which is being submitted after numerous amendments the form might appropriately be modified by changing the words "was amended on" to "with amendments through."

§1.335 Filing of notice of arbitration awards.

The written notices required by this section should be directed to the attention of the Office of the Solicitor, which Office will be responsible for processing of such notices.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act. (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. Public Law 97-247 has taken into consideration the impact it may have on small entities. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to foreign filing license petitions, will be reduced.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Courts, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Parts 1 and 5, are amended as follows:

1. Section 1.4 is amended by revising paragraph (a) to read as follows:

§1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises: (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§1.31 to 1.352; of international applications in Subpart C, §§1.401 to 1.482; of reexamination of patents in Subpart D, §§1.501 to 1.570; and of trademark applications, §§2.11 to 2.189.

* * * * *

2. Section 1.6 is revised to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

(b) Mail placed in the Patent and Trademark Office pouch up to midnight on weekdays, excepting Saturdays and federal holidays, by the post office at Washington, D. C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch.

(c) In addition to being mailed or delivered by hand during office hours, letters and other papers may be deposited up to midnight in a box provided at the guard's desk at the lobby of building 3 of the Patent and Trademark Office at Crystal Plaza, Arlington, Virginia and at the main entrance (14th Street) of the Department of Commerce Building, Washington, D. C., on weekdays except Saturdays and federal holidays, and all papers deposited therein are considered as received in the Patent and Trademark Office on the day of deposit.

(d) If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any paper or fee which is (1)

promptly filed after the ending of the designated interruption or emergency and (2) accompanied by a statement indicating that such paper or fee would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

3. Section 1.7 is revised to read as follows:

§1.7 Times for taking action: Expiration on Saturday, Sunday or federal holiday.

Whenever periods of time are specified in this part in days, calendar days are intended. When the day, or the last day fixed by statute or by or under this part for taking any action or paying any fee in the Patent and Trademark Office falls on Saturday, Sunday, or on a federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding day which is not a Saturday, Sunday, or a federal holiday. See §1.304 for time for appeal or for commencing civil action.

4. Section 1.8 is amended by revising the introductory text of paragraph (a) and paragraph (a)(1), (a)(2) introductory text, and (a)(2)(i) to read as follows:

§1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if: (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231, and deposited with the U.S. Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they also include a certificate for each paper or fee stating the date of deposit. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of a national patent application specification and drawing or other papers for the purpose of obtaining an application filing date;

* * * * *

5. A new section 1.10 is added to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service.

(b) Any paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing, be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and any such paper or fee must also include a certificate of mailing by "Express Mail" which states the date of mailing by "Express Mail" and is signed by the person mailing the paper or fee.

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

6. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph--$120.00

--§1.47--for filing by other than all the inventors or a person not the inventor
--§1.48--for correction of inventorship
--§1.182-for decision on questions not specifically provided for
--§1.183-to suspend the rules
--§1.268-for late filing of interference settlement agreement

* * * * *

7. Section 1.22 is revised to read as follows:

§1.22 Fees payable in advance.

(a) Patent and trademark fees and charges payable to the Patent and Trademark Office are required to be paid in advance, that is, at the time of requesting any action by the Office for which a fee or charge is payable with the exception that under §1.53 applications for patent may be assigned a filing date without payment of the basic filing fee.

(b) All patent and trademark fees paid to the Patent and Trademark Office should be itemized in each individual application, patent or other proceeding in such a manner that it is clear for which purpose the fees are paid.

8. Section 1.24 is revised to read as follows:

§1.24 Coupons.

Coupons in denominations of one dollar are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents and trademark registrations; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50. These coupons are good until used; they may be transferred but cannot be redeemed.

9. Section 1.41 is revised to read as follows:

§1.41 Applicant for patent.

(a) A patent must be applied for in the name of the actual inventor or inventors. Full names must be stated, including the family name and at least one given name without abbreviation together with any other given name or initial.

(b) Unless the contrary is indicated the word "applicant" when used in these sections refers to the inventor or joint inventors who are applying for a patent, or to the person mentioned in §§1.42, 1.43, or 1.47 who is applying for a patent in place of the inventor.

(c) Any person authorized by the applicant may file an application for patent on behalf of the inventor or inventors, but an oath or declaration for the application (§1.63) can only be made in accordance with §1.64.

(d) A showing may be required from the person filing the application that the filing was authorized where such authorization comes into question.

10. Section 1.42 is revised to read as follows:

§1.42 When the inventor is dead.

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may make the necessary oath or declaration, and apply for and obtain the patent. Where the inventor dies during the time intervening between the filing of the application and the granting of a patent thereon, the letters patent may be issued to the legal representative upon proper intervention.

11. Section 1.43 is revised to read as follows:

§1.43 When the inventor is insane or legally incapacitated.

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may make the necessary oath or declaration, and apply for and obtain the patent.

12. Section 1.45 is amended by removing paragraphs (b) and (c) and the designation (a) to the first paragraph and by revising the text to read as follows:

§1.45 Joint inventors.

Joint inventors must apply for a patent jointly and each must make the required oath or declaration: neither of them alone, nor less than the entire number, can apply for a patent for an invention invented by them jointly, except as provided in §1.47.

13. Section 1.46 is revised to read as follows:

§1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in §1.334.

14. Section 1.47 is revised to read as follows:

§1.47 Filing when an inventor refuses to sign or cannot be reached.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the omitted inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and by the required fee (§1.17(h)) and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and by the required fee (§1.17(h)) and must state the last known address

of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

15. A new section 1.48 is added to read as follows:

§1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee.

16. Section 1.51 is amended by revising paragraphs 1.51(a)(2) and (b) to read as follows:

§1.51 General requisites of a complete application.

(a) * * *

(2) An oath or declaration, see §§1.63 and 1.68.

* * *

(b) Applicants are encouraged to file an information disclosure statement. See §§1.97 through 1.99.

17. Section 1.52 is amended by revising paragraph (c) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to §1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers (§1.56(c)). After the signing of the

oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§1.121 and 1.123-1.125.

* * * * *

18. Section 1.53 is revised to read as follows:

§1.53 Serial number, filing date, and completion of application.

(a) Any application for a patent received in the Patent and Trademark Office will be assigned a serial number for identification purposes.

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office. No new matter may be introduced into an application after its filing date (§1.118).

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $50.00 handling fee.

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

(e) An application for a patent will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(f) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

19. Section 1.54 is revised to read as follows:

§1.54 Parts of application to be filed together; filing receipt.

(a) It is desirable that all parts of the complete application be deposited in the Office together; otherwise a letter must accompany each part, accurately and clearly connecting it with

the other parts of the application. See §1.53 with regard to completion of an application.

(b) Applicant will be informed of the application serial number and filing date by a filing receipt.

20. Section 1.55 is revised to read as follows:

§1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by §1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in §1.17(i).

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

21. Section 1.56 is amended by revising paragraph (c) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(c) Any application may be stricken from the files if:

(1) An oath or declaration pursuant to §1.63 is signed in

blank;

(2) An oath or declaration pursuant to §1.63 is signed without review thereof by the person making the oath or declaration;

(3) An oath or declaration pursuant to §1.63 is signed without review of the specification, including the claims, as required by §1.63(b);

or

(4) The application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

* * * * *

§1.57 [Removed]

22. Section 1.57 is removed.

23. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

24. Section §1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. Signing and execution of the application papers by the applicant may be omitted provided the copy is supplied by and accompanied by a statement by, the applicant or his or her attorney or agent that the application papers comprise a true copy of the prior application as filed. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

25. Section §1.62 is revised to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification and drawings from a

prior application to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on a prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior application.

(b) The filing fee for a continuation, continuation-in-part, or divisional application under this section is based on the number of claims remaining in the application after entry of any preliminary amendment and entry of any amendments under §1.116 unentered in the prior application which applicant has requested to be entered in the continuing application.

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In a continuation or divisional application which discloses and claims only subject matter disclosed in a prior application, no additional oath or declaration is required.

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number.

(f) The filing of an application under this section will be construed to include a waiver of secrecy by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

(g) The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.

(h) The applicant is urged to furnish the following information relating to the prior application to the best of his or her ability:

(1) Title as originally filed and as last amended;

(2) Name of applicant as originally filed and as last amended;

(3) Current correspondence address of applicant;

(4) Identification of prior foreign application and any priority claim under 35 U.S.C. 119.

(i) Envelopes containing only application papers and fees for filing under this section should be marked "Box FWC".

26. A new section 1.63 is added to read as follows:

§1.63 Oath or declaration.

(a) An oath or declaration filed under §1.51(a)(2) as a part of an application must:

(1) Be executed in accordance with either §1.66 or §1.68;

(2) Identify the specification to which it is directed;

(3) Identify each inventor and the residence and country of citizenship of each inventor; and

(4) State whether the inventor is a sole or joint inventor of the invention claimed.

(b) In addition to meeting the requirements of paragraph (a), the oath or declaration must state that the person making the oath or declaration:

(1) Has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration;

(2) Believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought; and

(3) Acknowledges the duty to disclose information which is material to the examination of the application in accordance with §1.56(a).

(c) In addition to meeting the requirements of paragraphs (a) and (b) of this section, the oath or declaration in any application in which a claim for foreign priority is made pursuant to §1.55 must identify the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior

copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

27. A new section 1.64 is added to read as follows:

§1.64 Person making oath or declaration.

(a) The oath or declaration must be made by all of the actual inventors except as provided for in §§1.42, 1.43, or 1.47.

(b) If the person making the oath or declaration is not the inventor (§§1.42, 1.43, or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state.

§1.65 [Removed]

28. Section 1.65 is removed.

29. Section 1.67 is revised to read as follows:

§1.67 Supplemental oath or declaration.

(a) A supplemental oath or declaration meeting the requirements of §1.63 may be required to be filed to correct any deficiencies or inaccuracies present in an earlier filed oath or declaration.

(b) A supplemental oath or declaration meeting the requirements of §1.63 must be filed (1) when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented, and (2) when an oath or declaration submitted in accordance with §1.53(d) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into an application after its filing date even if a supplemental oath or declaration is filed (§1.53(b); §1.118). In proper cases the oath or declaration here required may be made on information and belief by an applicant other than inventor.

30. Section 1.69 is amended by revising paragraph (b) to read as follows:

§1.69 Foreign language oaths and declarations.

* * * * *

(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under §1.63, the translation may be filed in

the Office no later than two months from the date applicant is notified to file the translation.

31. Section 1.70 is amended by revising the title and paragraph (a) to read as follows:

§1.70 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must file an oath or declaration in accordance with §1.63.

* * * * *

32. Section 1.77 is amended by revising paragraphs (h) and (i) to read as follows:

§1.77 Arrangement of application elements.

* * * * *

(h) Abstract of the disclosure.
(i) Signed oath or declaration.

* * * * *

33. The center heading preceding §1.97 and section 1.97 are revised to read as follows:

INFORMATION DISCLOSURE STATEMENT

§1.97 Filing of information disclosure statement.

(a) As a means of complying with the duty of disclosure set forth in §1.56, applicants are encouraged to file an information disclosure statement at the time of filing the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. If filed separately, the disclosure statement should, in addition to the identification of the application, include the Group Art Unit to which the application is assigned as indicated on the filing receipt. The disclosure statement may either be separate from the specification or may be incorporated therein.

(b) A disclosure statement filed in accordance with paragraph (a) of this section shall not be construed as a representation that a search has been made or that no other material information as defined in §1.56(a) exists.

34. Section 1.98 is amended by revising the title and paragraph (a) to read as follows:

§1.98 Content of information disclosure statement.

(a) Any disclosure statement filed under §1.97 or §1.99 shall include: (1) A listing of patents, publications or other information and (2) a concise explanation of the relevance of

each listed item. The disclosure statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the disclosure statement to be pertinent. All United States patents listed should be identified by their patent numbers, patent dates and names of the patentees. Each foreign published application or patent should be cited by identifying the country or office which issued it, the document number and publication date indicated on the document. Each printed publication should be identified by author (if any), title of the publication, pages, date and place of publication.

* * * * *

35. Section 1.99 is revised to read as follows:

§1.99 Updating of information disclosure statement.

If prior to issuance of a patent an applicant, pursuant to his or her duty of disclosure under §1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental information disclosure statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of §1.98.

36. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102 and those applications in which the Office has accepted a request for waiver of patent rights filed under §1.139. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

37. Section 1.118 is revised to read as follows:

§1.118 Amendment of disclosure.

(a) No amendment shall introduce new matter into the disclosure of an application after the filing date of the application (§1.53(b)). All amendments to the specification, including the

claims, and the drawings filed after the filing date of the application must conform to at least one of them as it was at the time of the filing of the application. Matter not found in either, involving a departure from or an addition to the original disclosure, cannot be added to the application after its filing date even though supported by an oath or declaration in accordance with §1.63 or §1.67 filed after the filing date of the application.

(b) If it is determined that an amendment filed after the filing date of the application introduces new matter, claims containing new matter will be rejected and deletion of the new matter in the specification and drawings will be required even if the amendment is accompanied by an oath or declaration in accordance with §1.63 or §1.67.

38. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner. The paper requesting amendments to the drawing should be separate from other papers.

39. Section 1.125 is revised to read as follows:

§1.125 Substitute specification.

If the number or nature of the amendments shall render it difficult to consider the case, or to arrange the papers for printing or copying, the examiner may require the entire specification, including the claims, or any part thereof, to be rewritten. A substitute specification may not be accepted unless it has been required by the examiner or unless it is clear to the examiner that acceptance of a substitute specification would facilitate processing of the application. Any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Such statement must be a verified statement if made by a person not registered to practice before the Office.

40. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant or the owner of the patent under reexamination shall make oath or declaration as to facts showing

a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the applicant or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the applicant's or patent owner's application was filed in this country.

* * * * *

41. Section 1.132 is revised to read as follows:

§1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

42. Section 1.137 is amended by revising paragraph (b) to read as follows:

§1.137 Revival of abandoned application.

* * * * *

(b) An application unintentionally abandoned for failure to prosecute, except pursuant to §1.53(d), may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date of abandonment of the application. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in §1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three month period set forth in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

* * * * *

43. Section 1.153 is amended by revising paragraph (b) to read as follows:

§1.153 Title, description and claim, oath or declaration.

* * * * *

(b) The oath or declaration required of the applicant must comply with §1.63.

44. Section 1.154 is amended by revising paragraph (e) to read as follows:

§1.154 Arrangement of specification.

* * * * *

(e) Signed oath or declaration (See §1.153(b)).

45. Section 1.162 is revised to read as follows:

§1.162 Applicant, oath or declaration.

The applicant for a plant patent must be the person who has invented or discovered and asexually reproduced the new and distinct variety of plant for which a patent is sought (or as provided in §§1.42, 1.43, and 1.47). The oath or declaration required of the applicant, in addition to the averments required by §1.63, must state that he or she has asexually reproduced the plant. Where the plant is a newly found plant the oath or declaration must also state that it was found in a cultivated area.

46. Section 1.163 is amended by revising paragraph (b) to read as follows:

§1.163 Specification.

* * * * *

(b) Two copies of the specification (including the claim) must be submitted, but only one signed oath or declaration is required. The second copy of the specification may be a legible carbon copy of the original.

47. Section 1.172 is amended by revising paragraph (a) to read as follows:

§1.172 Applicants, assignees.

(a) A reissue oath must be signed and sworn to or declaration made by the inventor or inventors except as otherwise provided (see §§1.42, 1.43, 1.47), and must be accompanied by the written

assent of all assignees, if any, owning an undivided interest in the patent, but a reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

* * * * *

48. Section 1.174 is amended by revising paragraph (a) to read as follows:

§1.174 Drawings.

(a) The drawings upon which the original patent was issued may be used in reissue applications if no changes whatsoever are to be made in the drawings. In such cases, when the reissue application is filed, the applicant must submit a temporary drawing which may consist of a copy of the printed drawings of the patent or a photoprint of the original drawings of the size required for original drawing.

* * * * *

49. Section 1.175 is amended by revising the introductory text of paragraph (a) to read as follows:

§1.175 Reissue oath or declaration.

(a) Applicants for reissue, in addition to complying with the requirements of §1.63, must also file with their applications a statement under oath or declaration as follows:

* * * * *

50. Section 1.324 is revised to read as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors.

51. Section 1.325 is revised to read as follows:

§1.325 Other mistakes not corrected.

Mistakes other than those provided for in §§1.322, 1.323, 1.324, and not affording legal grounds for reissue or for reexamination, will not be corrected after the date of the patent.

52. A new §1.335 is added to read as follows:

§1.335 Filing of notice of arbitration awards.

(a) Written notice of any award by an arbitrator pursuant to 35 U.S.C. 294 must be filed in the Patent and Trademark Office by the patentee, or the patentee's assignee or licensee. If the award involves more than one patent a separate notice must be filed for placement in the file of each patent. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the award.

(b) If an award by an arbitrator pursuant to 35 U.S.C. 294 is modified by a court, the party requesting the modification must file in the Patent and Trademark Office, a notice of the modification for placement in the file of each patent to which the modification applies. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the court's order modifying the award.

(c) Any award by an arbitrator pursuant to 35 U.S.C. 294 shall be unenforceable until any notices required by paragraph (a) or (b) of this section are filed in the Patent and Trademark Office. If any required notice is not filed by the party designated in paragraph (a) or (b) of this section, any party to the arbitration proceeding may file such a notice.

53. Section 5.12 is revised to read as follows:

§5.12 Petition for license.

(a) Filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject matter of the application. The filing receipt will indicate if a license is granted. If the initial automatic petition is not granted, a subsequent petition may be filed under paragraph (b) of this section.

(b) Petitions for license under 35 U.S.C. 184 should be presented in letter form and should include petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

Dec. 23, 1982
Date

Gerald J. Mossinghoff
Commissioner of Patents and Trademarks

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 27, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-19-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	8-28-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-18-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-06-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-17-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-16-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	2-02-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director Industrial Arts; Household, Personal and Fine Arts.	12-15-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	3-02-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	2-09-80

Expiration of patents: The patents within the range of numbers indicated below expire during November 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,214,767 to 3,221,338, inclusive

Plant Patents . . . . . Numbers 2,566 to 2,576 inclusive

REEXAMINATIONS

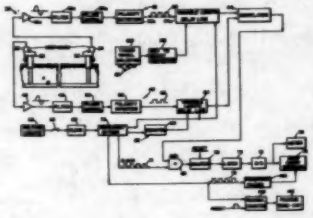
February 1, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,083,229 (49th)
METHOD AND APPARATUS FOR DETECTING AND LOCATING FLUID LEAKS

Allen R. Anway, Superior, Wis., assignor to Plaunt & Anderson Company, Inc., Duluth, Minn.

Reexamination Request No. 90/000,118, Dec. 2, 1981.
Reexamination certificate for Patent No. 4,083,229, issued Apr. 11, 1978, Ser. No. 727,359, Sep. 28, 1976.
U.S. Cl. 73/40.5 A **Int. Cl.³ G01M 3/00**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 17, 18, and 36–40 is confirmed.

Claims 6, 7, 9, 10, 12, 14, 23, 24, 27, 32 and 34, having been finally determined to be unpatentable, are cancelled.

Claims 1, 4, 13, 15, 19, 22, 25, 26, 28, 30, 31, 33, 35 and 41–43 are determined to be patentable as amended.

Claims 2, 3, 5, 8, 11, 16, 20, 21 and 29, dependent on amended claims, are determined to be patentable.

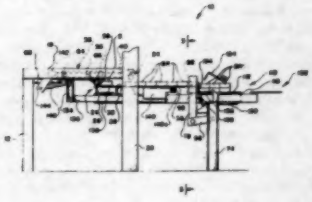
New claims 44–108 are added and determined to be patentable.

61. In an apparatus for locating a fluid leak in an underground or unexposed pipe or conduit, first means effective upon receipt of a vibration cause by the leak for producing a first electrical one-bit digital signal corresponding in phase and frequency to the received vibration, second means effective upon receipt of a vibration caused by the vibration caused by the leak for producing a second electrical one-bit digitial signal corresponding in phase and frequency to the received vibration, said first means comprising a first signal-producing transducer, and said second means comprising a second signal-producing transducer, said first and second transducers being selectively positionable to contact portions of a pipeline system containing said pipe for receiving the leak-produced vibration at spaced apart locations which lie along the path of the pipe such that the extent of correlation between said first and second signals is dependent on the time required for the leak-produced vibration to reach said locations, electrical time delay circuit means electrically connected to said first means for variably time delaying said first signal relative to said second signal to cause maximum mutual time correlation between the two signals, and third means providing an indication of the extent of time correlation between just the time delayed one of said signals and the other of said signals and for enabling the location of the leak to be determined from the time delay required to achieve said maximum mutual time correlation between just the time delayed one of said signals and the other of said signals.

B1 4,173,910 (50th)
METHOD AND APPARATUS FOR HANDLING BRICK

Cletus E. Lineberry, Staley; John G. Buckner, Ramseur; Jimmy W. Harris, Silver City, all of N.C., assignors to Auto-Systems and Service, Inc., Staley, N.C.

Reexamination Request No. 90/000,106, Nov. 12, 1981.
Reexamination Certificate for Patent No. 4,173,910, issued Nov. 13, 1979, Ser. No. 910,646, May 30, 1978.
U.S. Cl. 83/29 **Int. Cl.³ B26D 7/06.**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 14–19, 24 and 25 is confirmed.

Claims 2, 3, 4 and 20, having been finally determined to be unpatentable, are cancelled.

Claims 1, 5, 10, 21 and 23 are determined to be patentable as amended:

Claims 6–9, 11–13, and 22, dependent on amended claims, are determined to be patentable.

New claim 26 is added and determined to be patentable.

1. A brick stacking apparatus for receiving bricks from supply means and transferring the bricks to a receiving

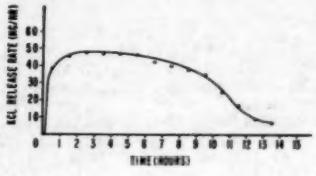
table in a manner that results in the transferred bricks forming at least a two course high stack on said receiving table, said brick stacking apparatus comprising: an elevator assembly adapted to be operatively mounted between said supply means and said receiving table for receiving bricks from said supply means and transferring the received bricks to said receiving table, said elevator assembly including at least two vertically spaced brick receiving levels with each receiving level including a generally horizontal support member for supporting bricks received within that receiving level; actuating means operatively connected to said elevator assembly for moving said elevator assembly and the receiving levels thereof between at least two vertically spaced positions wherein at each position at least one receiving level of said elevator assembly aligns with said supply means; and [transfer means for transferring bricks from said supply means to respective receiving levels of said elevator assembly in response to respective levels of said elevator assembly aligning with said supply means as said elevator assembly is actuated between said at least two vertically spaced positions, said transfer means further including means for simultaneously transferring bricks from at least the two receiving levels of said elevator assembly to said receiving table, whereby successive transfers from said elevator assembly to said receiving table results in an at least a two course high brick stack being formed on said receiving table] *transfer means for transferring bricks from said supply means to respective receiving levels of said elevator assembly and for simultaneously transferring bricks from at least the two receiving levels of said elevator assembly to said receiving table, said transfer means including a first pusher operative to push a single course formation of brick across said supply means and drive means for driving said first pusher in a predetermined time relationship relative to the vertical movement of said elevator assembly such that the actuation of said first pusher results in certain bricks on said supply means being pushed into an aligned receiving level of said elevator whereby said first pusher acts to successfully transfer bricks to each of the two receiving levels of said elevator assembly as the respective receiving levels align with bricks on said supply means during the vertical movement of said elevator assembly; said transfer means further including a second pusher cooperative with said first pusher to simultaneously cause the transfer of bricks from at least two levels of said elevator assembly onto said receiving table and drive means for driving said second pusher in a predetermined time relationship relative to the vertical movement of said elevator assembly and the actuation of said first pusher; and wherein the movement relationship of said elevator assembly and said first and second pushers are such that bricks in the two vertically spaced receiving levels are pushed from the elevator assembly simultaneously by (1) bricks entering one receiving level due to the actuation of said first pusher and the resulting movement of bricks from said supply means into that one receiving level, and (2) by the direct engagement of bricks in the other receiving level by said second pusher, wherein the exiting bricks from the uppermost disposed receiving level of said elevator assembly fall onto the exiting bricks from the lowermost disposed receiving level of said elevator assembly to form a two course high brick stack on said receiving table.*

B1 4,016,880 (51st)

OSMOTICALLY DRIVEN ACTIVE AGENT DISPENSER

Felix Theeuwes, Los Altos; Nalinkat C. Damani, Sunnyvale, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Reexamination Request No. 90/000,087, Oct. 14, 1981.
Reexamination Certificate for Patent No. 4,016,880, issued Apr. 12, 1977, Ser. No. 663,665, Mar. 4, 1976.
U.S. Cl. 128/260 **Int. Cl.³ A61M 31/00**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2–11, having been finally determined to be unpatentable, are cancelled.

Claim **1** is determined to be patentable as amended:

New claims 12–32 are added and determined to be patentable.

1. An osmotically driven active agent *pump* [dispenser] for *pumping an active agent containing solution into* [use in] an aqueous environment *at a substantially constant rate for an extended period of time after introduction into said environment, said pump* comprising:

(a) a core *containing an amount* of an osmotically effective pressure generating active agent composition *sufficient to maintain the concentration of said pressure generating composition in solution within the pump at the saturation level for said extended period of time;* and

(b) a substantially inexpandable wall having a substantially intact surface enclosing the core, said wall being substantially impermeable to the active agent composition [and], *at least a portion of said wall being permeable to water, said water permeable portion* having a controlled *and predetermined* permeability to water and including,

(c) means responsive to the pressure generated within the [dispenser] *pump* by imbibition of water from the environment by the core through the *water permeable portion of said* wall to create and form at least one exit passageway in situ in the wall through which the active agent composition in solution is pumped osmotically from the core into the environment at a substantially predetermined, substantially constant rate *after the formation of said exit passageway and for said extended period of time.*

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 1, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T102,701

INK JET INK COMPOSITION

Robert S. Cutler, 6125 Habitat Dr., #1096, Boulder, Colo. 80301, and Sterritt R. Fuller, Jr., Deer Trail Rd., Boulder, Colo. 80302

Continuation of Ser. No. 170,343, Jul. 21, 1980. This application Mar. 1, 1982, Ser. No. 353,722

Int. Cl.[3] **C09D** *11/10, 11/00*

U.S. Cl. 524—562

No Drawing. 18 Pages Specification

A liquid ink for use in ink jet printing, comprising a water-based dye, a water-soluble styrene/acrylic copolymer as the sole binder constituent, water and ammonia as a volatile drying conformant.

REISSUES

FEBRUARY 1, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

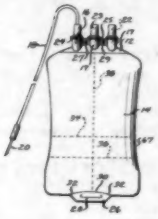
Re. 31,135
FLEXIBLE COLLAPSIBLE CONTAINERS, AND METHOD OF MOLDING

David A. Winchell, Twin Lakes, Wis.; Jerry D. Martin, Cary, Ill., and Frank L. Roe, Brookfield Center, Conn., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 4,191,231, dated Mar. 4, 1980, Ser. No. 817,940, Jul. 22, 1977. Application for reissue Mar. 3, 1982, Ser. No. 354,416

Int. Cl.³ B65D *35/08*

U.S. Cl. 150—8 5 Claims



1. A blow-molded, flexible, collapsible container, free of laterally positioned longitudinal seal [lines] *flaps*, which defines a sealed, collapsible portion of generally oval transverse cross-section and, defined at one end of said sealed portion, a shoulder portion having a wall thickness substantially thicker than the wall thickness of the sealed, collapsible portion, a plurality of spaced, upstanding sleeves being defined through said shoulder portion at said one end, the oval cross-sections of said sealed, collapsible portion defining major axes which are at least 50 percent greater than the minor axes of said oval cross-sections to facilitate flat collapse, and at the end of said container opposite to said shoulder portion end an integrally-attached, flat tail seal and hanger portion, said tail seal and hanger portion defining a continuous inner end integral with the remainder of said container material and having central and lateral portions, said continuous inner end being longitudinally recessed toward said container at its central portion relative to the lateral portions thereof to permit tucking of the hanger portion into the bag.

Re. 31,136
HERBICIDAL 5-PYRIMIDINECARBONITRILES

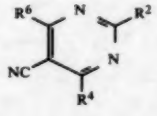
Gino R. Treves, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Original No. 4,092,150, dated May 30, 1978, Ser. No. 811,917, Jun. 30, 1977. Continuation-in-part of Ser. No. 718,224, Aug. 27, 1976, abandoned. Application for reissue Aug. 8, 1980, Ser. No. 176,615

Int. Cl.³ A01N *9/22*; C07D *239/34*

U.S. Cl. 71—92 20 Claims

3. A chemical compound having the structural formula



wherein

(a) R^2 is a radical selected from amino, lower alkylamino, lower cycloalkylamino, di(lower alkyl)amino, and [alpha-cyano(lower alkyl)]amino;

(b) R^4 is a lower alkoxy radical; and

(c) R^6 is a radical selected from amino, lower alkylamino, lower cycloalkylamino, and di(lower alkyl)amino;

with the proviso that neither R^2 nor R^6 is tert-butylamino; and provided further that when R^2 is isopropylamino, R^6 is other than n-butylamino; and when R^2 is methylethylamino, R^6 is other than isopropylamino; and when R^2 is diethylamino, R^6 is other than amino.

15. A method of controlling plant growth which comprises applying to the locus of the plants an herbicidally effective amount of a chemical compound of claim 3.

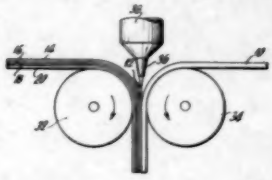
Re. 31,137
POUCH

William F. Ossian, Appleton; Thomas S. Wildenberg, Kimberly, both of Wis., and Henry Warmbier, Cary, Ill., assignors to American Can Company, Greenwich, Conn.

Original No. 4,190,477, dated Feb. 26, 1980, Ser. No. 901,644, May 1, 1978. Division of Ser. No. 866,928, Jan. 4, 1978, abandoned. Application for reissue Jan. 22, 1981, Ser. No. 227,527

Int. Cl.³ B29B *3/00*

U.S. Cl. 156—244.11 8 Claims



1. A method of making a multiply laminated structure comprising an inside sealing layer containing polypropylene and an outer metal foil layer, which method comprises:

(a) applying a primer layer to said metal foil, said primer layer being a graft copolymer of maleic anhydride and propylene wherein the maleic anhydride moieties are grafted onto a polypropylene backbone;

(b) drawing said primed metal foil laminate and said sealing layer in face-to-face relation into the nip defined by a pair of rollers; and

(c) simultaneously drawing a hot layer of extrusion grade polypropylene into said nip between said sealing layer and primer layer to thereby laminate said sealing layer to said primer layer.

6. *A method of making a multiply laminated structure comprising an inside sealing layer containing polypropylene and an outer metal foil layer, which method comprises:*

(a) applying a primer layer to said metal foil, said primer layer being a graft copolymer of maleic anhydride and propylene wherein the maleic anhydride moieties are grafted onto a polypropylene backbone;

(b) drawing said primed metal foil laminate and said sealing layer in face-face relation into the nip defined by a pair of rollers; and

(c) simultaneously drawing a hot layer of extrusion grade polymer containing polypropylene into said nip between said sealing layer and primer layer to thereby laminate said sealing layer to said primer layer.

Re. 31,138

SINGLE FACER FOR MANUFACTURING SINGLE-FACED CORRUGATED BOARD

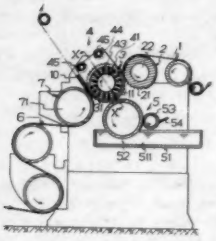
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Original No. 4,177,102, dated Dec. 4, 1979, Ser. No. 926,853, Jul. 21, 1978. Continuation-in-part of Ser. No. 778,613, Mar. 17, 1977, abandoned. Application for reissue Apr. 16, 1981, Ser. No. 254,972

Claims priority, application Japan, Apr. 19, 1976, 51-45136; Dec. 30, 1976, 51-158989

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—473 **24 Claims**



13. A single facer for manufacturing single-faced corrugated board comprising:

(a) a first fluted corrugating roll;

(b) a second fluted corrugating roll meshing with said first corrugating roll to form a nip for receiving a sheet medium to corrugate the same;

(c) plural axially spaced circumferential grooves disposed about the periphery of the second corrugating roll, said grooves each having a bottom located below the bottoms of the flutes on the second roll;

(d) plural suction conduits formed in the periphery of the second corrugating roll to provide a suction force for attracting and holding the corrugated sheet medium onto a portion of the peripheral surface of the second corrugating roll, each said suction conduit having an inner end and an outer end, said outer suction conduit ends terminating at the bottoms of the grooves whereby said outer ends are spaced from the corrugated medium on the second corrugating roll;

(e) a source of suction connected to the inner ends of the suction conduits;

(f) means for applying adhesive to the peaks of the flutes of the corrugated medium; and

(g) a pressure roll for pressing a sheet linerboard against the corrugated medium after the adhesive has been applied, to bond the linerboard to the corrugated medium.

Re. 31,139

MANUFACTURE OF MALIC ACID

Carl R. Ahlgren, East Aurora, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Original No. 3,379,756, dated Apr. 23, 1968, Ser. No. 404,166, Oct. 15, 1964. Application for reissue Nov. 8, 1979, Ser. No. 92,306

Int. Cl.³ C07C *59/245*

U.S. Cl. 562—582 **9 Claims**

1. In a process for the synthesis of malic acid from an acid selected from the group consisting of maleic acid, fumaric acid and mixtures thereof in an aqueous reaction mixture at elevated temperature and pressure, the improvement of performing the synthesis in a zone whose surfaces exposed to the reaction mixture consist of at least one material from the group of titanium, zirconium, and tantalum and alloys containing at least 90% of said metal.

PLANT PATENTS

GRANTED FEBRUARY 1, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,979

SUGAR MAPLE TREE NAMED LEGACY

Willet N. Wandell, Myra Station Rd., Rte. 3, Box 158, Urbana, Ill. 61801

Filed Mar. 18, 1981, Ser. No. 245,153

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of sugar maple tree, substantially as herein shown and described, characterized by its relatively dense and fast growth of 38.2 percentum better than other sugar maple trees in the same stand, freedom from leaf tatter during all seasons as exhibited by sugar maple trees in a wide area of the Midwest, numerous strategically placed branches, an abundance of dark colored, leathery leaves with more leaves on the tight, compact crown, its relative ease of propagation and an excellent survival rate of buds through the winter months, with leaves having a protective wax by cutin layer which is 1.5 times thicker than leaves on ordinary sugar maple trees in the stand, the leaves having a protective wax by cutin which is 1.5 times thicker than normal sugar maple trees.

PATENTS

GRANTED FEB. 1, 1983

ERRATA

For CLASS	See PATENT NO.
464–156	4,370,869
604–098	4,370,982
292–048	4,371,205
384–118	4,371,216
384–291	4,371,219
384–371	4,371,220
436–087	4,371,374
419–056	4,371,396
436–544	4,371,515
523–144	4,371,648
523–145	4,371,649
528–388	4,371,671
544–300	4,371,734
544–300	4,371,735
544–316	4,371,736
544–370	4,371,737
422–186	4,371,787

PATENTS

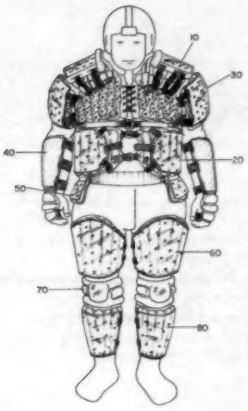
GRANTED FEBRUARY 1, 1983

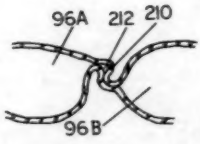
GENERAL AND MECHANICAL

4,370,754
VARIABLE PRESSURE PAD

Byron A. Donzis, Houston, Tex., assignor to American Pneumatics Co., Houston, Tex.

Continuation-in-part of Ser. No. 928,425, Jul. 27, 1978, Pat. No. 4,217,705, which is a continuation-in-part of Ser. No. 842,250, Oct. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 774,276, Mar. 4, 1977, abandoned. This application Sep. 28, 1979, Ser. No. 80,095
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **32 Claims**





1. Rib pads for protecting the ribs comprising:

a fluid pressurized pad covering the ribs and being made of a fabric material which does not distend under pressure, said pad including a plurality of interconnected fluid chambers formed by sealing adjacent surfaces of said material;

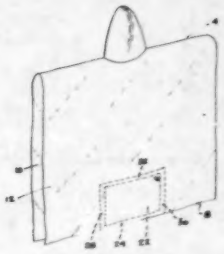
valving means for preventing surges of fluid within said fluid chambers, said valving means including folds of said material at the interconnections of said fluid chambers whereby said folds must be opened to permit fluid flow from one chamber to another; and

rigid means for apportioning an external force applied to said pad, said rigid means covering the exterior of said fluid pressurized pad.

4,370,755
COMBINATION PONCHO AND CUSHION

John T. Crumby, 206 Scenic Dr., Oak Ridge, Tenn. 37830

Continuation-in-part of Ser. No. 67,110, Aug. 14, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,679
Int. Cl.³ A41D *3/08*
U.S. Cl. 2—88 **1 Claim**



1. A combination poncho and seating cushion for human use, comprising a rectangular sheet of single ply waterproof material having side edges and transverse edges and having an opening positioned substantially midway between the side and transverse edges for the reception and passage of the head of the wearer, the poncho being adapted and constructed to form front and rear panels when folded about a line extending transversely from the lead receiving opening with the fold line resting on the shoulders of the wearer, the rear panel being of such length that when the poncho is worn with the wearer in a standing position the lower edge of the rear panel is adjacent and below the buttocks of the wearer, a substantially rectangular sheet of single ply waterproof material attached about its periphery to the inner surface of the rear panel of the poncho with one of its edges substantially aligned with the lower edge of the rear panel at the center thereof, said attached sheet being larger in areas than the outline of its edges, thereby forming an inflatable enclosed pocket at and adjacent the buttocks of the wearer in a standing or seated position, and means for inflating the pocket to form a cushion.

4,370,756
MULTIPLE PLY GARRISON CAP

Paul G. Gallin, Bronxville, N.Y., assignor to Art Cap Company, Inc., New York, N.Y.

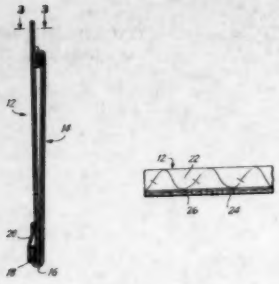
Filed Oct. 29, 1980, Ser. No. 202,012
Int. Cl.³ A42B *1/04*
U.S. Cl. 2—195 **7 Claims**

1. A multiple ply garrison cap comprising

a crown portion and an outer band portion extending upwardly from the lower margin of said crown portion and surrounding the lower parts of said crown portion and attached thereto,

both said crown portion and said band portion comprising a multiple ply laminated material including an outer ply of

textile suiting material and an inner ply of nylon tricot textile material with the two textile materials being securely bonded together by means of a thin layer of polyester foam.



4,370,757

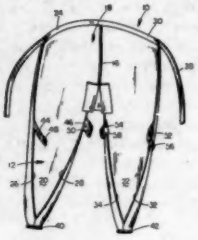
GARMENT WITH A MODESTY PANEL

Bonnie D. Richmond, 11206 Martha, Omaha, Nebr. 68134

Filed Mar. 19, 1982, Ser. No. 359,946

Int. Cl.³ A41B *9/00*

U.S. Cl. 2—400 **3 Claims**



1. A garment comprising:

first and second garment portions each having upper and lower ends and inner and outer side edges,

said first and second garment portions being joined together at their upper inner side edges to form a body portion which may be wrapped around a person to cover the lower abdomen, thighs and buttocks of the person,

means for maintaining said body portion on the person,

said first and second garment portions having means at their lower ends forming ankle receiving portions,

said first and second garment portions having a width sufficient, between said body portion and said ankle receiving portions, to enable said first and second garment portions to be wrapped around the person's legs,

means on said first and second garment portions above said ankle receiving portions to maintain said garment portions on the person's legs,

and a foldable modesty panel at the juncture of said upper inner side edges of said first and second garment portions extending downwardly therefrom for covering the person's genital area.

4,370,758

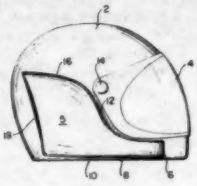
SOUND ATTENUATOR FOR USE IN CONJUNCTION WITH THE MOTORCYCLE HELMET OR THE LIKE

Dale B. Mattheis, 10790 Falk Rd. NE., Bainbridge Island, Wash. 98110

Filed Oct. 27, 1980, Ser. No. 201,290

Int. Cl.³ A42B *3/02*

U.S. Cl. 2—423 **6 Claims**



2. A motorcycle helmet which reduces the noise created by passing wind without lessening the ability of a rider to hear comprising:

a rigid exterior shell approximating the shape of a wearers head and including the necessary padding or other attachments to provide safety and comfort,

outwardly extending helmet configuring elements extending along each side of the helmet and forming a smooth surface therealong, said elements forming a contoured smoothly flowing leading portion which extends rearwardly while simultaneously becoming more prominent along the horizontal and vertical dimensions of the helmet and terminating at a position normally behind the ear of the wearer in a flared open condition generally reducing noise created while passing through the wind and yet permitting entry of traffic noise.

4,370,759

FACE GUARD MOUNT FOR HELMETS

Robert Zide, Williamstown, W. Va., assignor to Pro-Line, Inc., Marietta, Ohio

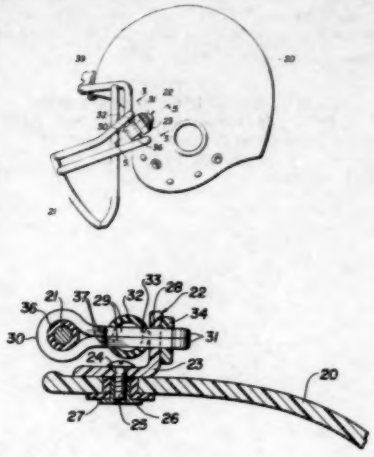
Filed Mar. 17, 1981, Ser. No. 244,710

Int. Cl.³ A42B *1/08*

U.S. Cl. 2—424 **15 Claims**

5. In a helmet, a substantially rigid helmet shell, a substantially rigid face guard for the helmet, and a yielding shock absorbing mount for the face guard including an anchor element attached to the shell, said anchor element comprising a bracket having a wall projecting outwardly from said shell and said wall having an aperture, a connecting element attached to the face guard and having a shank portion engaged movably with the anchor element and, adapted to reciprocate within said aperture, a head carried by the shank portion, a clip detachably engageable with the shank portion between said head and said wall to retain the connecting element engaged movably with said anchor element, and a resilient shock absorbing

element engaged between parts of the anchor and connecting elements and yieldingly resisting movement of the connecting element in one direction relative to the anchor element in response to an impact force on the face guard.

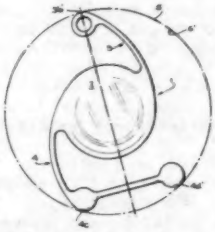


4,370,760

ANTERIOR CHAMBER INTRAOCULAR LENS

Charles D. Kelman, 269-70 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Mar. 25, 1981, Ser. No. 247,570
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **29 Claims**



1. An intraocular lens adapted to be implanted in the groove formed between the iris and the scleral spur in the anterior chambers of human eyes of different anterior chamber diameters, including:

an optic,

a pair of lateral position fixation means connected with said optic,

one of said position fixation means including a first contact portion adapted to seat in the upper portion of the groove,

the other position fixation means including a second contact portion adapted to seat in the lower portion of the groove,

said optic having opposite peripheral portions and said one position fixation means having a first portion extending outwardly from a first of said peripheral portions and said other position fixation means having a first portion extending outwardly from a second of said peripheral portions,

at least one of said pair of position fixation means having a second portion extending from the first portion generally transversely thereto and at least partly peripherally of said optic, said second portion of said position fixation means having that part of its peripheral edge which faces said optic spaced from the periphery of said optic and having a free end portion,

said first and second contact portions being constructed and arranged for relative movement therebetween to assume a first fully extended position in which said contact portions are spaced apart a distance substantially approximating the largest anterior chamber diameter within the range of anterior chamber diameter sizes most commonly exhibited by human eyes, and a plurality of second positions corresponding to the different anterior chamber diameters of different eyes within said range,

said pair of position fixation means being constructed and arranged to undergo said relative movement from said first to any of said second positions thereof while limiting movement of said optic along the optical axis thereof in anterior direction toward the cornea to a distance not substantially in excess of 1.0 mm and to a position in which the optic, after seating of the lens in the anterior chamber groove corresponding to any of said second positions, will be sufficiently spaced from the cornea to minimize risk of contact between the optic and the cornea during normal deformations of the eyeball thereafter, and

at least one of said pair of position fixation means being effective to urge said contact portions in a direction to assume said fully extended position so as to maintain said contact portions seated in the respective groove portions upon said lens being implanted in an eye having an interior chamber diameter of any size within said range,

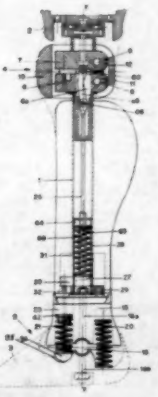
whereby said position fixation means properly position the lens in the anterior chamber of any eye exhibiting any anterior chamber diameter within said range.

4,370,761

ARTICULATED PROSTHESIS FOR LOWER LIMB

Roberto Serri, Via T. Signorini 21, Scandicci (Firenze), Italy

Filed May 22, 1981, Ser. No. 266,167
Claims priority, application Italy, May 28, 1980, 9450 A/80; Feb. 27, 1981, 9350 A/81
Int. Cl.³ A61F *1/08*
U.S. Cl. 3—26 **4 Claims**



1. An articulated prosthesis comprising:

first means for anchoring said prosthesis to a thigh;

a knee joint connected to said first means;

a post connected at its upper end to said knee joint;

an ankle joint connected to a lower end of said post;

a foot connected to said ankle joint;

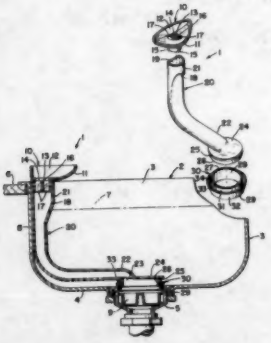
said post defining a vertical axis;
said knee joint including first and second vertically aligned horizontal axes, said first and second horizontal axes being disposed rearward of said vertical axis;
a first movable element in said knee joint affixed to said first means, said first movable element being pivoted on said first horizontal axis and extending forward to intersect said vertical axis;
a second movable element in said knee joint affixed to said post, said second movable element being pivoted on said second horizontal axis and extending forward to intersect said vertical axis;
first and second interengaging toothed portions on said first and second movable elements respectively, each toothed portion being concentric with its respective horizontal axis;
said ankle joint including a third horizontal axis, said vertical axis intersecting said third horizontal axis;
said foot being rotatable about said third horizontal axis;
a first vertical spring operative to urge rotation of said foot in a first direction about said third horizontal axis to move a toe of said foot downward;
a second vertical spring operative to urge rotation of said foot in a second direction about said third horizontal axes to move said toe upward;
said first vertical spring being stronger than said second vertical spring;
second means for reducing a force applied by said first vertical spring to a value below a force applied by said second vertical spring when said knee joint is bent whereby said toe of said foot is urged upward to clear the ground when said foot is raised while said prosthesis is moved forward to straighten said knee in preparation for a next step.

4,370,762

PORTABLE ATTACHMENT FOR SINKS

John Heil, Dayton, Ohio, assignor to Allcraft Plastic Company, Inc., Dayton, Ohio

Filed Mar. 13, 1981, Ser. No. 243,525
Int. Cl.³ E03C *1/24*
U.S. Cl. 4—206 **3 Claims**



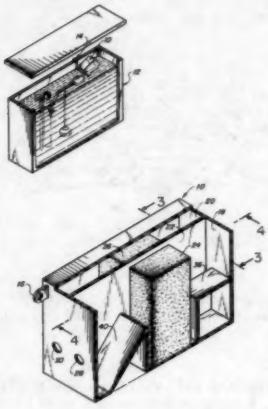
1. A sink attachment for use in a sink having a drain, said attachment comprising:
an elbow-shaped member having a first end and a second end, said elbow-shaped member having a hollow interior open at said first and second ends;
a receptacle having a wide mouth which tapers down to a hollow extension which is shaped to be received in said first end; and
sealing means associated with said second end for providing a sealing engagement between said sink atachment and said sink drain, said sealing means including a sealing member having a downwardly directed substantially cylindrical portion, and a gasket received around said cylindrical portion, said gasket being a continuous hollow piece having a first end and a second end, said second end having a larger circumference than said first end, with said piece folding over itself to provide two walls of unequal height having a recess therebetween, with said first end engaging saiu cylindrical portion of said sealing member.

4,370,763

AUTOMATIC DOSING DISPENSER

John E. Dolan, Old Orchard St., Harrison, N.Y. 10528

Filed May 20, 1981, Ser. No. 265,555
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—228 **9 Claims**



1. A dispenser immersible in a body of liquid, said dispenser comprising:
at least one chamber for producing a dose amount of liquid solution of a detergent or the like to be dispensed into said body of liquid as the level of said body falls;
intake means at one end of said dispener for receiving a predetermined quantity of liquid from said body;
said chamber within said dispenser holding a block of solid material from which said liquid solution is to be formed, and including means for initially retaining said predetermined quantity of liquid and isolating it from said block of material;
flotation means at the other end of said dispenser;
exit means for permitting the dose amount of liquid solution to flow out of said dispenser;
means for moving said dispenser in accordance with the force produced by said flotation means at said one end as the level of said body of liquid rises, such that, said intake means receives said predetermined quantity of liquid while said exit means cannot receive any substantial quantity from said body; and such that said dose amount of liquid solution is dispensed in accordance with gravity through said exit means as the level of the body of liquid falls.

4,370,764

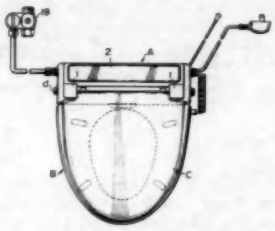
TOPICAL WASHING DEVICE

Shizuka Ando; Hiroshi Oyama, and Toshio Yamaguchi, all of Kitakyushu, Japan, assignors to Toto, Ltd., Fukuoka, Japan

Filed Mar. 31, 1981, Ser. No. 249,676
Int. Cl.³ A61H *35/00*; A47K *3/22*
U.S. Cl. 4—443 **22 Claims**

1. A topical washing device for cleaning a body portion of a user, said device comprising:

(a) a washing nozzle for discharging washing water towards said body portion;
(b) a water feed line connecting said washing nozzle to a source of water and adapted to conduct said water therethrough;
(c) a heat exchanger provided along said water feed line and forming a portion of said water feed line;
(d) a heater on said heat exchanger to heat water flowing through said heat exchanger;
(e) a sensor on said heat exchanger which is simultaneously sensitive to the temperature of the surface of said heater and the temperature of water discharged by said heat exchanger;
(f) a heat-sensitive safety switch on said heat exchanger which is adapted to cut off a power supply once water within said heat exchanger reaches a predetermined tem-



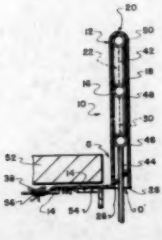
perature level and to thereby deenergize an electromagnetic valve positioned along said water feed line upstream of said heat exchanger to terminate water supply to said heat exchanger and deactuate said heater to prevent overheating of water within said heat exchanger;
(g) a temperature controller electrically connected to said heater and said sensor to control the output of said heater in response to signals received from said sensor,
said heat exchanger including a pair of juxtaposed vessels and a metallic conduit fluidically communicating said vessels, whereby said vessels and said conduit are comprised of high thermally conductive metal, said heater and said sensor being connected to one of said vessels, and the other of said vessels, which is positioned downstream of said one vessel along said feed line, having a volume sufficient to hold a predetermined quantity of washing water.

4,370,765

ENVELOPE FOR A BED HAVING SIDE RAILS

Gloria C. Webber, 44 Gail Dr., New Rochelle, N.Y. 10805

Filed Sep. 5, 1980, Ser. No. 184,646
Int. Cl.³ A47C *21/08*; A47G *9/00*
U.S. Cl. 5—427 **5 Claims**



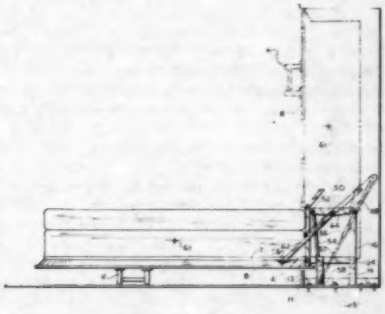
1. An envelope sized and adapted for use with a bed having a mattress support and one or more substantially horizontal side rails vertically spaced from the upper plane of a mattress when placed on a mattress support, comprising an enveloping portion and a flap extending freely therefrom, the enveloping portion having a closed top and side portions and being adapted to fit over and envelop one or more of the vertically spaced side rails, and the flap being adapted to extend under the adjacent longitudinal lower side edge of a mattress, and having means for securing the flap to a mattress support in a manner that prevents a mattress from shifting out of its proper position on a mattress support, and prevents a bed occupant or his or her appendage from becoming lodged between two side rails and/or between the lowermost of the one or more vertically spaced side rails and the mattress or mattress support.

4,370,766

PANEL BED AND COUNTERBALANCING MECHANISM FOR PANEL BED

W. Dorwin Teague, Jr., Nyack, N.Y., assignor to Murphy Door Bed Company, Inc., New York, N.Y.

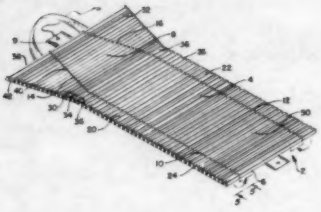
Filed Dec. 4, 1980, Ser. No. 213,054
Int. Cl.³ A47C *19/06*
U.S. Cl. 5—133 **11 Claims**



1. A bed which is moved between a horizontal open position for use and a vertical closed position for storage, and a counterbalancing mechanism which includes first pivot means which supports one end of said bed and provides first pivot with a first pivot axis about which said bed is swung in moving between said open and closed positions with said bed having a rigid frame and means which cooperates to provide said first pivot means, said counterbalancing mechanism comprising a rigid fixed structure and two lever and gas-spring assemblies mounted thereon, said rigid fixed structure comprising two support units spaced from each other substantially the width of said bed and positioned whereby said one end of said bed is between said support units when said bed is in said closed position, said rigid fixed structure also including means rigidly attaching said support units stationary in said spaced relationship, said lever and gas-spring assemblies being mounted respectively upon said support units and each including a lever and second pivot means therefor which provides a second pivot axis parallel to said first pivot axis and spaced horizontal and vertical distances from said first pivot axis with said horizontal distance being substantially equal to the length of said lever, each of said lever and gas-spring assemblies also including a link interconnecting the central portion of said lever to said frame with the connection to said frame being adjacent the bottom of said bed and spaced horizontally away from its support unit when said bed is in said open position and being positioned substantially above said first pivot when said bed is in said closed position, and a gas spring which is mounted to exert a force on said lever which is transmitted through said link to provide a lifting moment on said bed about said first axis, the relationship between said gas spring and said lever and said link and the pivot axes thereof being such that said lifting moment varying in a pattern which is similar to the pattern of

the moment of the force of gravity about said first pivot axis as said bed is moved between said open and closed positions.

4,370,767
BEACH MAT
Alberto Fraser, Guaynabo, P.R., assignor to Commonwealth of Puerto Rico, San Juan, P.R.
Filed Apr. 14, 1981, Ser. No. 254,169
Int. Cl.³ A45C 9/00
U.S. Cl. 5—417 6 Claims



1. A rest mat for human use which may be disposed in various configurations for supine, seated, backrested and other positions, having an upper surface to receive the body, a lower surface, a head end and a bottom end, and comprising these component parts:

(a) an elongated center section extending from end to end of the mat and having

i. a bottom end part with parallel side edges, and

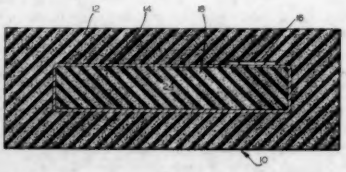
ii. a head end part with side edge which form continuations of the side edges of the bottom end part and converge therefrom to the head end of the mat,

(b) side edge panels which extends along the side edges of the bottom end part of the center section and are pivotally connected thereto to be folded behind the upper surface of the mat into engagement with the lower surface thereof,

(c) side edge panels which extend along each side edge of the head end part of the center section and are pivotally connected thereto to be folded toward the lower surface of the mat, and

i. each of the side edge panels at the head end of the mat having outer side edges which diverge toward the head end of the mat.

4,370,768
DAMPED FLUID DISPLACEMENT SUPPORT SYSTEM
William S. Saloff, Heather La., R.M., Gloversville, N.Y. 12078
Filed Apr. 25, 1980, Ser. No. 143,723
Int. Cl.³ A47C 27/08
U.S. Cl. 5—450 10 Claims



3. A damped liquid displacement support system comprised of:

an envelope of flexible material;

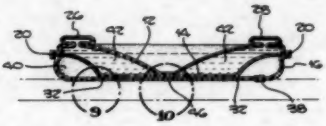
a core of resilient liquid-absorbent material occupying substantially all of the space within the envelope;

a liquid substantially saturating the core;

a valve mounted in the envelope for communicating between its interior and its ambience for admitting and discharging liquids and gases; and

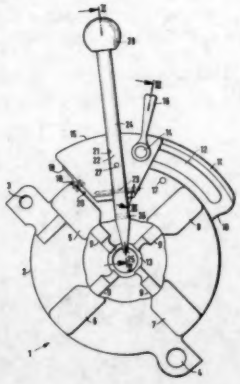
a relatively thick casing of resilient material surrounding the envelope, said casing having a top portion lying above the core and a bottom portion lying below the core, said bottom and top portions each being substantially equal in thickness to the core itself.

4,370,769
CUSHION UTILIZING AIR AND LIQUID
Ralph B. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90210, and Howard G. Cohen, 10420 Eastborne Ave., West Los Angeles, Calif. 90024
Filed Sep. 19, 1980, Ser. No. 188,688
Int. Cl.³ A47C 27/10
U.S. Cl. 5—452 10 Claims



1. As an article of manufacture, a cushion comprising in combination, impervious flexible material shaped to form a cushion and comprising plies bonded together at the edges along sides and back of the cushion whereby to form a lower air chamber and at positions spaced from the sides and back of the cushion and to form an upper liquid chamber, having slack portions at the sides and back of the cushion, whereby the pressure exerted by the weight of a person and the air pressure forces water in the water chamber into portions of the water chamber around the sides and back of a person seated on the cushion.

4,370,770
CUTTING HEAD FOR THREAD CUTTING MACHINES
Rudolf Wagner, Stuttgart, Fed. Rep. of Germany, assignor to Rems-Werk Christian Föll und Söhne GmbH & Co., Waiblingen, Fed. Rep. of Germany
Filed Jul. 17, 1980, Ser. No. 169,606
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929337
Int. Cl.³ B23G 5/12
U.S. Cl. 10—96 R 14 Claims



1. A thread-cutting head for pipes, tubes, and the like, comprising in combination:

a cutting-jaw holder;

cutting jaws arranged in said cutting-jaw holder and having a cutting position in a thread cutting range relative to a thread cutting axis;

a control disc displaceably supported on and connected rotatable relative to said cutting-jaw holder, said cutting jaws being radially adjustable by said control disc;

a clamping screw for adjusting said control disc, which for the cutting position of said cutting jaws relative to said cutting-jaw holder is adapted to be tensioned and arrested against a spring force;

an arresting piece arranged on said control disc and provided with a pivot pin directed transverse to the thread cutting axis, said arresting piece being shiftable as limited by spring force to move in a peripheral direction of said cutting-jaw holder relative to the holder;

a single clamping lever pivotally journalled directly on said arresting piece about said pivot pin, that end of said clamping lever located in the region of said cutting jaws being embodied as an unlatching abutment which projects into the thread-cutting range, said lever also having a grip means with which said arresting piece, the unlatching abutment and said control disc are adjustable into a starting position thereof;

a catch member arranged between said cutting-jaw holder and said arresting piece which is secured against shifting by said catch member in the starting position; and

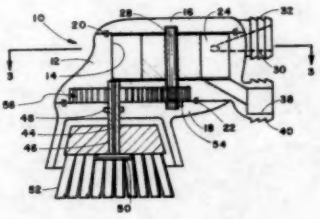
a release pin provided on said clamping lever and directed against said catch member, which is adjustable into a position releasing said arresting piece by said release pin actuatable by said clamping lever.

4,370,771

WATER-DRIVEN BRUSH

Sulpicio A. Gonzalvo, 18772 Eisenhower Clr., Salinas, Calif. 93906

Filed Nov. 6, 1980, Ser. No. 204,640
Int. Cl.³ A46B *13/06*
U.S. Cl. 15—29 **1 Claim**



1. A water-driven brush which comprises

a housing forming an interior cylindrical chamber,

a turbine mounted for rotation in said chamber,

a water inlet port adapted to discharge water tangentially into said housing against said turbine to effect rotation thereof,

a main discharge outlet port extending from said chamber at a position spaced angularly from said water inlet port only slightly less than 360 degrees,

a second smaller outlet port extending from said chamber in a hollow rotary shaft connected to said turbine by gearing so that it is positioned adjacent the edge of said chamber, and

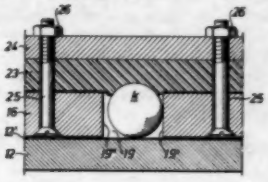
a rotary brush member on said hollow rotary shaft surrounding said second outlet port and operatively connected to said turbine.

4,370,772

DEVICE FOR GENTLE TREATMENT OF SPHERICAL BALLS

Berth U. Gustafsson, Österskär, Sweden, assignor to Projectus Industriprodukter AB, Bromma, Sweden

PCT No. PCT/SE79/00028, § 371 Date Sep. 18, 1980, § 102(e) Date Sep. 18, 1980, PCT Pub. No. WO80/01664, PCT Pub. Date Aug. 21, 1980
PCT Filed Feb. 9, 1979, Ser. No. 262,068
Int. Cl.³ B08B *1/04*; B24B *11/06*
U.S. Cl. 15—97 R **13 Claims**



1. A device for gentle mechanical cleaning of substantially spherical balls in the presence of a treatment fluid, comprising:

a first and second disc being substantially parallel and rotatable relative to each other;

said discs being operatively positioned to permit balls to be cleaned to follow a spiral path between the discs while being cleaned;

said first disc including a planar frictional surface;

said second disc being provided with at least one spiral guiding groove being wider than the diameter of said balls;

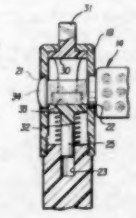
a resilient counter pressure cushion being arranged in each groove of said second disc in opposite relation to said first disc to resiliently press the balls into frictional contact with said frictional surface of said first disc.

4,370,773

TOOTHBRUSH

Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20014

Filed Jul. 10, 1980, Ser. No. 167,362
Int. Cl.³ A46B *9/10*
U.S. Cl. 15—172 **8 Claims**



1. A toothbrush comprising:

an elongate handle means having opposite end portions, one of said end portions comprising a hollow, diametrically enlarged base capable of supporting the toothbrush in an upright position and of a size to receive and store a bristle head therein;

the other end of the handle means comprising an elongate, reduced diameter shaft having an axial bore in the end thereof;

a tubular member fixed to the end of said shaft and having a pair of diametrically aligned openings in the side thereof;

a bristle head adjustably carried by the handle means at said

other end thereof and including a bristle head shaft projecting therefrom, said bristle head shaft extending at approximately a right angle to the axis of the handle means and releasably adjustably engaged with the handle means to support the bristle head in adjusted positions on the handle means, and bristles on the bristle head extending in a direction mutually perpendicular to the axis of the handle means and the axis of the bristle head shaft;

said bristle head shaft extending through the aligned openings in the tubular member having a polygonal cross sectional configuration; and

bristle head retaining means carried in the tubular member for selective engagement with the bristle head shaft to prevent it from rotating and to retain it on the handle means, said retaining means having a channel shaped and sized complementally to the bristle head shaft and being actuatable through the end of the handle means for releasing the bristle head.

4,370,774

WINDSHIELD WIPER ASSEMBLY

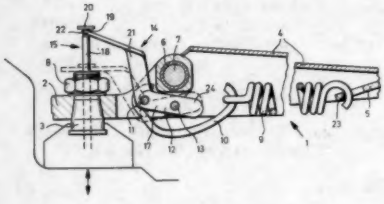
Herbert Bienert, Besigheim; Dieter Hanselmann, Aldingen; Alfred Kohler, and Hans Prohaska, both of Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 25, 1979, Ser. No. 42,305

Claims priority, application Fed. Rep. of Germany, Jan. 6, 1978, 2824014

Int. Cl.³ B60S *1/34*

U.S. Cl. 15—250.2 **18 Claims**



1. A wiper assembly for a windshield on a vehicle comprising:

a wiper motor shaft, and a wiper arm, said wiper arm comprising:

a wiper blade;

a wiper rod carrying said wiper blade;

a link coupled to said wiper rod;

a fastening member articulated to said link and mounted on said wiper shaft;

a wiper arm spring having one end connected to said wiper rod;

a lever pivotally connected to said fastening member;

a holding pin carried by said lever and coupled to the other end of said spring; and

actuating means operable while said wiper arm is operating for moving said lever to selectively place said holding pin in first and second predetermined positions, whereby when said holding pin is in said first or said second predetermined position, said wiper blade is urged against said windshield at a first or a second level of pressure, respectively; the direction of movement of said holding pin between said first and second predetermined positions being approximately perpendicular to the longitudinal axis of said spring.

4,370,775

MULTI-PURPOSE CONNECTOR

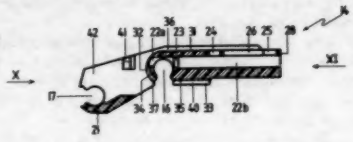
Johan H. van den Berg, Hasselt, and Robert T. Le Sausse, Brussels, both of Belgium, assignors to Champion Spark Plug Europe, S.A., Virton, Belgium

Filed Mar. 27, 1981, Ser. No. 248,256

Claims priority, application France, Apr. 11, 1980, 80 08172

Int. Cl.³ B60S *1/40*

U.S. Cl. 15—250.32 **17 Claims**



1. A connecting device (**14,15**) for fitting a wiper blade selectively to a wiper arm of a first-type (*3a,3b*) or to a wiper arm of a second type (*1a,1b, 2a, 2b*) wherein the superstructure (**9**) of the wiper blade has a pivot pin (**13**) upon which said connecting vice (**14,15**) is fitted by means of first attaching means (**16**) connected to said pivot pin, characterized in that said connecting device further comprises a second spaced apart means (**17**) for being alternately attached to said pivot pin (**13**).

4,370,776

VACUUM CLEANER FOR HOUSEHOLD AND INDUSTRIAL APPLICATION

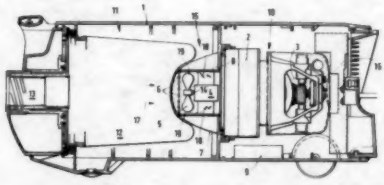
Günter R. J. Kullik, Meinerzhagen, Fed. Rep. of Germany, assignor to Progress-Elektrogeräte Mauz & Pfeiffer GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,101

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030066

Int. Cl.³ A47L *9/28*

U.S. Cl. 15—319 **16 Claims**



1. A vacuum cleaner for home and industry, comprising:

a housing having an inlet for drawing in dirt-laden air with a working air flow, and an outlet for discharging environmentally acceptable air;

an electric motor mounted in said housing;

a suction fan mounted in said housing and driven by said electric motor for generating said working air flow in the form of a vacuum flow;

an electrical converter in the form of a generator mounted in said housing and driven by said working air flow, said generator detecting the strength of said working air flow; and

a regulating and control circuit associated with said housing for regulating the speed of said electric motor, the output of said generator being connected with said regulating and control circuit.

4,370,777

ELECTRIC MOTOR CONTROL FOR VACUUM CLEANER

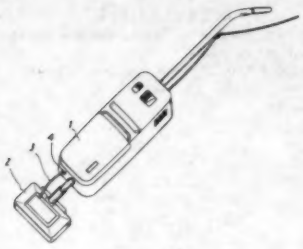
Peter Woerwag, Stuttgart, Fed. Rep. of Germany, assignor to Duepro AG, Romanshorn, Switzerland

Filed Nov. 28, 1980, Ser. No. 211,353

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947994

Int. Cl.³ A47L 9/00

U.S. Cl. 15—339 5 Claims



1. A vacuum cleaner comprising:
a housing having a suction nozzle orifice;
a cylindrical brush rotatably mounted by said housing in said orifice;
a first motor drivingly connected to said brush for rotating said brush;
a suction motor connected to produce suction through said nozzle shaped orifice;
a power source;
an rpm control device connected to said power source; and
switch means for connecting said first motor and said suction motor individually either to said rpm control device or directly to said power source, whereby said first motor and said suction motor can be connected: in parallel with each other to said rpm control device; in parallel with each other directly to said power source; and separately with one of said motors connected to said rpm control device and the other of said motors connected directly to said power source.

4,370,778

METHOD, A BINDER, AND AN APPARATUS FOR BINDING SAUSAGE CASINGS

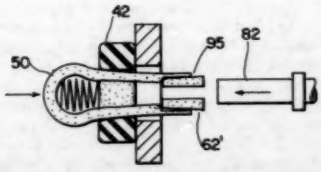
Erik Madsen, Jens Juulsvei 13, 8260 Viby J., Denmark

Continuation of Ser. No. 962,917, Nov. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 748,158, Dec. 7, 1976, abandoned. This application Dec. 1, 1980, Ser. No. 211,806

Claims priority, application United Kingdom, Dec. 12, 1975, 51015/75; Mar. 23, 1976, 11700/76; Nov. 23, 1977, 48826/77

Int. Cl.³ A22C 15/00

U.S. Cl. 17—45 30 Claims



1. A sausage binder comprised of two or more plastic elements being assemblable to form a closed, split clamping ring about a constricted area of a sausage casing and adapted to be rigidly anchored together in this shape, said elements comprising a U-shaped element having a pair of legs and a cross element having opposed end surfaces mountable so as to bridge and be secured with said end surfaces disposed between opposed inner portions of the legs of said U-shaped element, wherein said cross element is comprised of two half-pieces, and said half-pieces are provided with groove and ridge surfaces for interfitting with each other.

4,370,779

METHOD AND APPARATUS FOR INTERMITTENTLY DISPENSING FLOWABLE FOODSTUFF

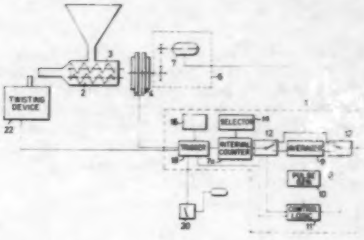
Dieter Meier, Kirchlintein, Fed. Rep. of Germany, assignor to Vemag, Verden, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,088

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921427

Int. Cl.³ A22C 11/08; G01F 13/00

U.S. Cl. 17—49 14 Claims



1. In a method for intermittently dispensing a flowable foodstuff into containers in portions of a predetermined size including the steps of conveying the foodstuff with a conveyor into a container, braking the conveyor so as to deliver a portion of foodstuff into a container, replacing the container with a fresh container, and conveying another portion into the fresh container, the improvement comprising the steps of measuring a terminal mass of the foodstuff flowing into the container during the step of braking, forming a difference value between the portion of predetermined size and the measured terminal mass, and thereafter initiating the braking step after a quantity of the foodstuff has been conveyed into the fresh container which equals the difference value so that the terminal mass continuing to flow into the fresh container after the initiating step supplies sufficient additional foodstuff to bring the portion in the fresh container to the predetermined size.

4,370,780

PROCESS AND DEVICE FOR AXIAL SHIRRING OF A TUBULAR MATERIAL USING AN AIR STREAM

Gunter Kollross, AM Wallerstadter Weg 20, D-6081 Dornheim, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 220,893

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952715

Int. Cl.³ A22C 13/02

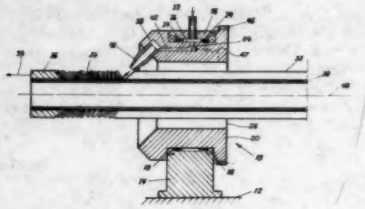
U.S. Cl. 17—49 14 Claims

1. A process for axial shirring of a thin walled tubular material such as a sausage casing material, comprising the steps of:
delivering the tubular material axially along a mandrel which braces the interior thereof, as the forward end of the tubular material engages a back-up means,
and axially compacting the tubular material, as it is being delivered along the mandrel, by forming shirrings therein by directing at least one air stream against the tubular material in a direction which is toward the direction of travel of the tubular material and oblique relative to the

axis of the tubular material, wherein the air stream force revolves about the axis of the tubular material.

6. A device for axial shirring of a thin walled tubular material such as a sausage casing material, comprising:

a mandrel means for receiving a tubular material movable therealong and for bracing the interior of the tubular material, a back-up positioned to be engaged by the forward end of the tubular material which has been moved axially along the mandrel,



shirring means for axially compacting the tubular material, as it moves along the mandrel, by forming shirrings therein, said shirring means comprising means for delivering at least one air stream against the tubular material toward the direction of travel of the tubular material and obliquely relative to the axis of the tubular material,

and means for causing the force of the air stream to revolve about the axis of the tubular material.

4,370,781

CLEARER DEVICE PROVIDED ABOVE DRAFT ROLLS

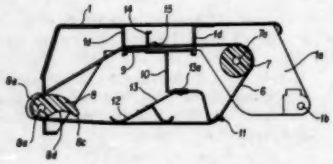
Yoshio Murao, No. 6-8, 3-chome, Masuizumi, Kanazawa-shi, Japan

Filed Dec. 2, 1980, Ser. No. 212,128

Claims priority, application Japan, Dec. 3, 1979, 54/167811[U]

Int. Cl.³ D01H *5/62*

U.S. Cl. 19—245 **3 Claims**



1. A clearer device of a plurality of draft rolls, including top rolls, within a drawing frame, comprising:

cover means having one end pivotally secured to said drawing frame and having side plates;

at least one guide member associated with said cover;

at least one rotatable clearer roll associated with said cover;

at least one endless clearer member extending around said at least one guide member and said at least one clearer roll, said at least one clearer member being positioned so as to contact said top draft rolls when said cover is pivoted in a first closed position;

at least one pressure member resiliently associated with said cover and adapted to pressure said at least one endless clearer member into contact with said top draft rolls;

means for intermittently driving said at least one rotatable clearer roll; and

comb means associated with said cover, said comb means being positioned in angularly adjustable contact with said at least one clearer member, wherein said comb is in contact with the top course of said at least one clearer member and said comb is secured to the bottom of an L-shaped lateral bar, the central portion of which is adjustably held on a support member; and wherein said guide members each include beak portions having curved lower surfaces cooperable with one of said top rolls, and further include lateral guide walls, whereby said endless clearer member is guided between said one top roll and said guide member.

4,370,782

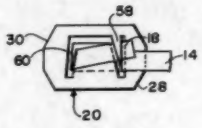
BELT RETAINER

John A. Aronica, Southboro, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed Aug. 25, 1980, Ser. No. 180,681

Int. Cl.³ A41B *9/00*

U.S. Cl. 24—198 **3 Claims**



1. A disposable belt retainer for securing a non-apertured belt of a sterile operating room gown, said belt having one end attached to said gown adjacent the waist of said gown and a free end extending around said waist,

said disposable belt retainer comprising,

a generally rectangular strip of semi-rigid deformable material having a back surface adapted to be attached to said gown, a front surface, opposite generally vertical edges, top and bottom edges connecting said opposite vertical edges, and a continuous belt retaining and locking cutout slot spaced inwardly from said edges, said cutout slot having an upper horizontal belt inserting portion adjacent said top edge, a vertical belt receiving portion extending downwardly from each of the opposite ends of said horizontal belt inserting portion adjacent each of said vertical edges, and two vertical belt clamping and locking slit portions, one thereof being connected to and extending upwardly from the lower end of each of said vertical belt receiving portions

said cutout slot defining

a central vertically extending tab connected to said strip adjacent said strip bottom edge with an upper edge portion adjacent to and spaced downwardly from said strip top edge, said central tab having a downwardly extending tab extension connected to said central tab upper edge portion adjacent one side edge of said central tab and positioned adjacent one of said strip side edges, and

a side downwardly extending tab connected to said strip adjacent said strip top edge and positioned between the vertical edge of said central tab opposite said tab extension and the opposite one of said strip side edges

whereby, said belt may be inserted into said retainer to secure it therein by grasping its free end to extend it horizontally, then moving a horizontally extending belt portion bodily downwardly through said upper horizontal belt inserting slot portion behind said central tab into said downwardly extending vertical belt receiving slot portions and finally moving said horizontally extended belt portion upwardly into said upwardly extending belt clamping and locking slit portions

the deformability of said tabs permitting release of said belt by grasping its free end and pulling said secured belt portion forwardly out of said retainer by bending said tabs and tab extension.

4,370,783

YIELDABLE LOAD RELEASE CONNECTOR

Jack W. Fretwell, Jr., 13354 Feldman Pl., Herndon, Va. 22070

Continuation of Ser. No. 940,289, Sep. 7, 1978, abandoned. This application Dec. 11, 1980, Ser. No. 216,011

Int. Cl.³ F16G *11/00*

U.S. Cl. 24—201 TR **4 Claims**

1. Load release connector for connecting a first and a second object comprising a coil of resilient plastic rod extending for at least about 540° and having two free ends, and fastening means attached to said coil at a point spaced substantially equidistant from each said end for fastening said coil to said first object, said coil encircling said second object thereby connecting said two objects, said resilient plastic rod having a plastic memory enabling it to return to its coil form after application and release of forces tending to straighten it and having high fatigue strength enabling it to be flexed repeatedly by said straightening forces without substantial loss of said plastic memory, said coil of resilient plastic rod being extended from its coil shape into an oblong shape and said free ends being further from said fastening means when forces are applied causing said first and second objects to move away from each other, said second object being released when said coil of resilient plastic rod is extended sufficiently far that the ends thereof separate to permit said second object to pass there-between, said resilient plastic rod while extended into said oblong shape resisting further moving away from each other of said first and second objects and urging said objects toward each other.

4,370,784

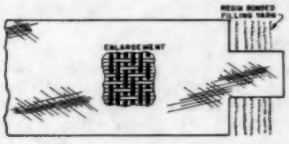
BELTING FABRIC

John Turnbull, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 15,974, Feb. 28, 1979, Pat. No. 4,298,648. This application Apr. 7, 1981, Ser. No. 251,814

Int. Cl.³ B65N *71/00*

U.S. Cl. 28—166 **13 Claims**



1. A process for preparing an improved woven coilable belting fabric for use in a seat belt harness, in which the warp yarns constitute at least 70 percent of the fabric by weight, by weaving warp yarns along the length of the belt and multifilament filling yarns transverse to the length of the belt, the improved belt having reduced tendency to twist and jam a conventional retractor mechanism that coils the belt upon activation of a retraction mechanism, which process comprises the steps of:

(i) applying an uncured heat-curable resin to said multifilament filling yarns prior to weaving;

(ii) weaving a fabric wherein said filling yarns constitute less than 30 percent by weight of said fabric; and

(iii) curing said uncured resin after weaving,

whereby said woven coilable fabric has both high lateral stiffness and high conversion efficiency load from the individual warp yarns to fabric along the warp yarns.

4,370,785

METHOD FOR MAKING ULTRACOUSTIC TRANSDUCERS OF THE LINE CURTAIN OR POINT MATRIX TYPE

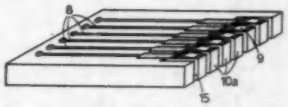
Donelio Assenza, and Massimo Pappalardo, both of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed Jun. 6, 1980, Ser. No. 157,281

Claims priority, application Italy, Jun. 22, 1979, 49520 A/79

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **14 Claims**



1. A method for making ultraacoustic transducers of the curtain line and point matrix type, comprising:

providing a bar (**10**) of piezoelectric material having a polarization axis and having a ratio between its width and its thickness substantially equal to one;

metalizing both faces (**2,4**) of said bar which are perpendicular to the polarization axis;

connecting said bar (**10**) along one (**3**) of the non-metalized faces thereof to a face of a substrate (**5**);

depositing at least one metallic electrode (**8**) on both opposite faces (**6,7**) of said substrate (**5**) which are normal to said face of said substrate (**5**) connected to said piezoelectric bar (**10**);

connecting said metallic electrodes (**8**) to said metalized faces (**2,4**) of said piezoelectric bar (**10**) by depositing a layer (**9**) of conductive epoxy resin on the plane of said two opposite faces (**6,7**) of said substrate (**5**) which are normal to said face (**3**) connected with said piezoelectric bar (**10**); and coating the whole assembly comprising said bar (**10**), substrate (**5**) and electrodes (**8**), with a complete jacket (**11**) of epoxy resin.

4,370,786

WIRE LEAD FORMING MACHINE

John D. Butler, New Berlin, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Feb. 20, 1981, Ser. No. 235,443

Int. Cl.³ B21F *23/00, 1/02*

U.S. Cl. 29—33 M **6 Claims**

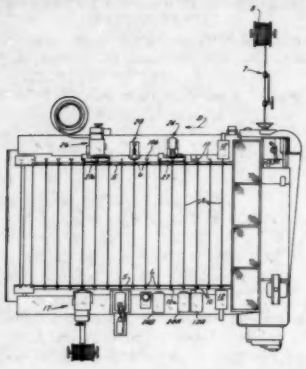
1. In a wire lead forming machine wherein a cable length is constrained to stepwise motion transversely to its length in one direction along a defined path, to a stripping station at which insulation is stripped off of one end portion of each of a pair of wires of the cable length by means of stripping devices that rotate on fixed parallel axes, and subsequently to a plug attachment station at which said wire end portions are brought into axially inserted relationship to respective tubular plug legs that are in spaced parallel relation to one another, means for controlling the position and orientation of said end portions of said wires at each of said stations to ensure that they will have coaxial relationship to said rotary devices at the stripping station and to said plug legs at the plug attachment station, said means comprising:

A. a wire holding and bending device at each of said stations for receiving said end portions of said wires when they are substantially straight and laterally adjacent to one another

and for bending said end portions apart to establish their tip portions in spaced substantially parallel relationship;

B. straightening means at a straightening station along said path that is between and spaced from said stripping and plug attachment stations, said straightening means comprising

(1) a first pair of jaws relatively movable between an open position at which said end portions of the wires are receivable between the jaws as the cable length is



moved into said straightening station and a closed position at which opposed confining surfaces on the jaws confine said end portions to substantially coplanar relationship, and

(2) a second pair of jaws relatively movable towards and from one another between said confining surfaces and having opposed pusher surfaces which are substantially normal to said confining surfaces and whereby confined end portions of the wires are displaced into substantially straight laterally adjacent relationship.

4,370,787

APPARATUS FOR SECURING TO FORMAT CYLINDERS FORMAT PLATES FOR THE ACCURATE TRANSFER OF APPLICATIONS OF ADHESIVE

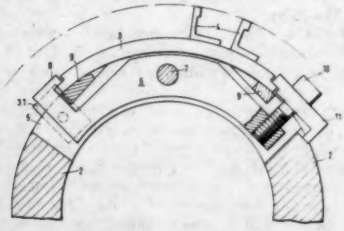
Richard Feldkämper, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,672

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948744

Int. Cl.³ B21B 27/00; B41F 27/10

U.S. Cl. 29—124 6 Claims



1. Apparatus for securing a format plate to a format cylinder comprising:

a format cylinder having a peripheral surface thereof provided with two axially spaced recesses having circumferential lengths greater than the circumferential width of a format plate to be secured to said cylinder;

a two-armed lever positioned in each said recess and having first and second ends;

means for pivotally mounting said levers in said recesses for pivotable movement about central portions of the levers;

gripper means positioned at the first ends of said levers for engaging and securing a first axially extending longitudinal edge of the format plate;

clamping means for clamping and securing a second axially extending longitudinal edge of the format plate, said clamping means having first portions supported by the format cylinder, second portions engaging the format plate, and holes passing therethrough, tapped holes being formed in the second ends of said levers; and

clamping screws having shanks passing through said holes of said clamping means and threaded ends engaged in said tapped holes of said second lever ends whereby rotation of said clamping screws urges said clamping means and said gripper means into clamping engagement with the format plate.

4,370,788

METHOD OF LINING CYLINDRICAL BORES

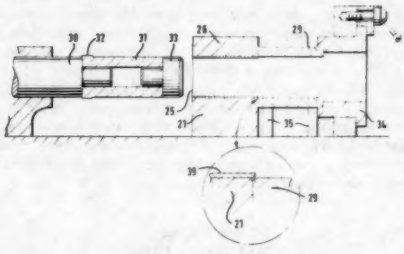
Archibald J. S. Baker, Wantage, England, assignor to Cross Manufacturing Company Limited, Oxfordshire, England

Filed Sep. 5, 1980, Ser. No. 184,239

Claims priority, application United Kingdom, Sep. 7, 1979, 7931186

Int. Cl.³ B23P 11/00

U.S. Cl. 29—156.4 WL 9 Claims



1. A method of lining a cylindrical bore, which method comprises the steps of:

(a) providing a block having a cylindrical bore;

(b) selecting a strip of lining material having free ends and of such a length that when said strip is formed into a cylindrical liner for said cylindrical bore and then pressed into said cylindrical bore, said formed strip is subjected to hoop-stress;

(c) providing a jig-plate defining a groove of arcuate cross-section with a radius of curvature substantially equal to that of the unlined bore and a co-operable mandrel which has an at least partially circular cross-section the diameter of which is substantially equal to that of the lined bore;

(d) positioning said strip of lining material in said jig-plate and employing said jig-plate to press said selected strip into said groove;

(e) retaining the partially-formed strip in the groove of the jig-plate and employing jig cheek-pieces each of which defines a part-circular groove of substantially the same radius of curvature as the groove in the jig-plate further to deform said strip by moving said jig cheek-pieces with respect to said jig-plate to a position in which said cheek-piece grooves and said jig-plate groove together define a cylinder of substantially the same diameter as that of the unlined bore, thereby enclosing and deforming said strip with said free ends abutting one another to form a cylin-

drical liner which is subjected to hoop-stress within the jig; and

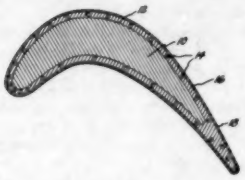
(f) pressing the thus-formed liner out of the jig into the cylindrical bore whilst maintaining the hoop-stress within said liner thereby forming a lined block.

4,370,789

FABRICATION OF GAS TURBINE WATER-COOLED COMPOSITE NOZZLE AND BUCKET HARDWARE EMPLOYING PLASMA SPRAY PROCESS

Peter W. Schilke, 4 Hempshire Ct., Scotia, N.Y. 12302; Myron C. Muth, R.D. #3, Western Ave., Amsterdam, N.Y. 12010; William F. Schilling, 301 Garnsey Rd., Rexford, N.Y. 12148, and John R. Rairden, III, 6 Coronet Ct., Schenectady, N.Y. 12309

Filed Mar. 20, 1981, Ser. No. 246,068
Int. Cl.³ B21K *3/04*
U.S. Cl. 29—156.8 H **4 Claims**



1. A method for fabricating composite nozzle and bucket hardware for a gas turbine, comprising the steps of:

providing a structural framework in the form of a spar having tubes for coolant near the surface thereof; and

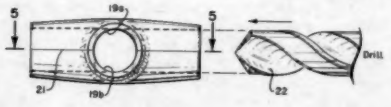
applying a dense, non-porous coating of high thermal conductivity copper alloy to the structural framework by means of low pressure plasma arc spraying in a thickness of at least 50 mils (1.27 mm) so as to cover the coolant tubes and to allow excess coating for smooth machining.

4,370,790

T-JOINT METHOD AND PRODUCT

Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Dec. 19, 1980, Ser. No. 218,218
Int. Cl.³ B21D *53/00*
U.S. Cl. 29—157 T **2 Claims**



1. A method of making a tubular T-joint, including the steps of:

(a) forming a cruciform-shaped stamping into a main cross-piece portion having opposite edges diverging from each other from each end towards the center and having semi-cylindrical stem portions extending in opposite directions from the central portion of said main cross-piece portion, each of said stem portions having their opposite edges diverging from their free ends towards the cross-piece portion;

(b) rolling the cross-piece portion into a cylindrical shape by bringing its said opposite edges together to form a cross-piece, the semi-cylindrical portions thereby being brought together to form a stem;

(c) welding the opposite edges of the cross-piece and the opposing edges of the semi-cylindrical stem portions together to form a T-joint;

(d) drilling through the cross-piece with a drill of diameter corresponding to the central inside diameter of the cross-piece to thereby remove material as the drill enters one end and exits through the opposite end on either side of the central portion of the cross-piece to provide tapered walls with a uniform inside diameter for the cross-piece; and

(e) drilling into said stem with the same diameter drill used for said cross-piece to remove material at the entrance portion of the stem

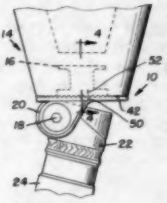
whereby the wall thickness of the resulting T-joint is greater at the intersection of the cross-piece and the stem than at the opposite ends of the cross-piece and entrance ends of the stem.

4,370,791

METHOD OF FORMING AN ADJUSTABLE PROSTHETIC ELEMENT

Michael T. Wilson, 1259 Monument Blvd., Concord, Calif. 94520

Division of Ser. No. 11,126, Mar. 19, 1979, Pat. No. 4,283,800. This application Mar. 27, 1981, Ser. No. 248,555
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—407 **4 Claims**



1. A method for forming a human prosthesis of at least two elements in which one element is incrementally rotatable in the transverse plane relative a second element, the method comprising the steps of:

a. providing a first prosthetic element having a toothed superior surface;

b. providing and securing retention means to said first prosthetic element for removably retaining a molded plastic socket adjacent the first prosthetic element;

c. providing a removable spacer element between the retention means and the superior surface of the first prosthetic element; and

d. forming from plastic material, superior to the first prosthetic element, a second prosthetic element in the form of a prosthetic socket about the retention means and said removable spacer element using the toothed superior surface to form the inferior surface of the socket.

4,370,792

METHOD OF COVERING SURFACES WITH TENSILE SHEET MATERIALS

Warren G. Watts, 1 Little La., Westport, Conn. 06880

Filed Aug. 10, 1981, Ser. No. 291,411
Int. Cl.³ B23Q *17/00*
U.S. Cl. 29—407 **12 Claims**

1. A method for covering a surface with a tensile sheet material comprising the steps of:

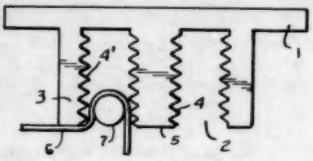
(a) attaching a frame to the surface to be covered, with the frame being made of tracks having at least one longitudinal slot with a pair of confronting side walls which are ridged,

(b) cutting the material to a width slightly greater than the distance separating the tracks plus twice the depth of a slot,

(c) inserting one edge of the material and an elastic spline over the material into a slot, whereby the spline is substantially flush with a face of the track,

(d) inserting the opposite edge of the material into a slot of the opposite track with an elastic spline over the material whereby the spline is substantially flush with the face of the track,

(e) setting the spline and material halfway to the bottom of



the slot for one edge and then repeating it for the other edge, and

(f) setting the spline and material all the way to the bottom of the slot for one edge and then repeating it for the other edge, whereby the material is stretched completely taut between the tracks.

4,370,793

METHOD OF COUPLING TWO METALLIC MEMBERS

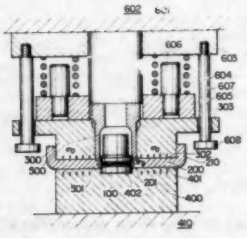
Hisanobu Kanamaru, Higashiishikawa; Moisei Okabe, Tokyo; Hideo Tatsumi, Sumiyoshi, and Akira Tohkairin, Tahiko, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

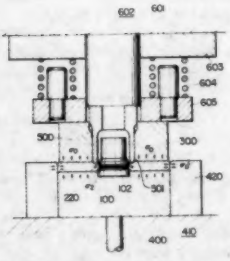
Filed Jan. 3, 1980, Ser. No. 109,266

Claims priority, application Japan, Jan. 10, 1979, 54-699

Int. Cl.[3] **B23P** *11/02;* **B21D** *39/00;* **B23P** *11/00, 14/02*

U.S. Cl. 29—446 **21 Claims**





1. A method of coupling a first metallic member and a second metallic member, the method comprising the steps of:

forming a circumferentially extending groove in a joint face of the first metallic member;

forming uneven portions along a bottom of the groove;

assemblying the first metallic member and second metallic member by disposing the joint face of the first metallic member substantially concentrically with a joint face of the second metallic member;

applying an actual annular prestress to the second metallic member at least in a vicinity to be cold worked; and

then cold working an annular portion of the second metallic member with a first work member in a vicinity of the joint face so as to cause a plastic deformation and cause a portion of the second metallic member to fluidize and flow into the groove while applying said actual prestress to the second metallic member at least in a vicinity of said cold work portion by a second work member separate from said first work member for the colding working so as to prevent substantial flow of the second metallic member except into the groove, thereby coupling the first metallic member to the second metallic member.

21. A method of coupling a first metallic member and a second metallic member, the method comprising the step of:

forming a circumferentially extending groove in a joint face of the first metallic member;

assemblying the first metallic member and second metallic member by disposing the joint face of the first metallic member substantially concentrically with joint a face of the second metallic member;

applying an actual annular prestress to the second metallic member at least in a vicinity to be cold worked; and

then cold working an annular portion of the second metallic member with a first work member in a vicinity of the joint face so as to cause a plastic deformation and cause a portion of the second metallic member to fluidize and flow into the groove while applying said actual prestress to the second metallic member at least in a vicinity where said cold working is effective by a second work member separate from said first work member so as to substantially prevent an influencing of said cold working to the second metallic member except for a flow of the second metallic member into the groove thereby coupling the first metallic member to the second metallic member.

4,370,794

CLINCH NUT AND METHOD OF INSTALLING SAME

Alfred A. Bien, West Bloomfield, and Frederick W. Heidt, Fenton, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 931,696, Aug. 7, 1978, abandoned. This application Oct. 1, 1980, Ser. No. 193,327

Int. Cl.[3] **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—509 **2 Claims**

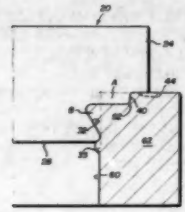
1. A method of installing a nut in a panel, comprising the steps of:

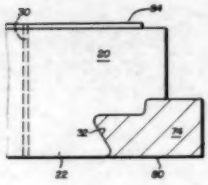
punching a rectangular opening in said panel,

inserting and press-fitting the projecting rectangular pilot of a metal nut in said panel opening, said panel having a thickness greater than the pilot height, said pilot having a generally flat end face and side faces inclined inwardly from said end face and said nut having opposed laterally extending flanges extending from said pilot portion, said flanges having abutment faces spaced from the top faces of said flanges and extending laterally from said inclined side faces to a perpendicular edge spaced from the side faces of said flanges, said inclined pilot side faces smoothly blending into said pilot end face in generally opposed cylindrical segment rounds and into said flange abutment faces in opposed generally cylindrical segment rounds and fillets which promote panel flow beneath said inclined side faces and the volume defined by the projection of said abutment faces above said flanges being less than four times greater than the volume of the spaces beneath said inclined pilot faces, said opposed cylindrical segment round surfaces of the pilot end face forming opposed rounded projections in the walls of the panel opening at the leading edge of the pilot, and

ramming said opposed abutment faces of said nut flanges against the opposed panel face adjacent said opening in a single continuous stroke, deforming and displacing the panel beneath said inclined pilot side faces and continuing

to force said abutment faces into said panel to seat said top faces against said panel and fill the spaces beneath the





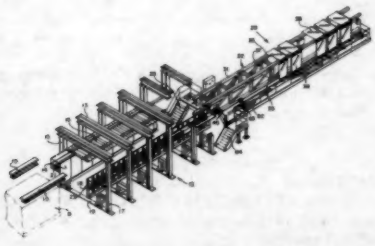
inclined side pilot faces, permanently retaining said nut in said panel opening.

4,370,795

APPARATUS AND METHODS TO PROVIDE SHORING DURING THE MANUFACTURING OF A REEFER CONTAINER

Robert B. Reidenbach, Honeybrook, Pa., assignor to The Budd Company, Troy, Mich.

Filed Nov. 24, 1980, Ser. No. 209,545
Int. Cl.³ B29D *23/00*
U.S. Cl. 29—559 **8 Claims**



1. Apparatus for providing external and internal shoring for the roof and side walls of an open container to permit foam material to be inserted under pressure into cavitites therein, comprising:

a. a first fixed station including first selectively movable shoring members;

b. said first station being disposed to receive said container with the external surfaces of said roof and side walls thereof in alignment with said first shoring members to permit external shoring thereof;

c. a second station including second selectively movable shoring members to provide internal shoring of the internal surfaces of said roof and side walls of said container;

d. said second station including movable mandrel disposed on a fixed platform for holding said second selectively movable members;

e. said movable mandrel comprising a rectangular open frame assembly including a pair of rail elements;

f. means for selectively extending said mandrel from said fixed platform into the open area of said container within said first station to bring said second shoring members into alignment with the interior surfaces of said roof and side walls of said container to permit shoring thereof, and

g. said means for selectively moving said mandrel comprising drive wheels secured to said fixed platform in frictional engagement with said side rail elements and motor means for rotating said drive wheels to extend and retract said side rail elements and said frame assembly into and out of the open area of said container within said first station.

7. A method of shoring the external and internal surfaces of the side walls and roof of an open container with a floor to permit foam insulating material to be inserted under high pressures into cavities within said side walls and ceiling comprising the steps of:

a. providing a first fixed station having a first set of movable shoring members;

b. providing a second station having a fixed platform with a movable mandrel thereon with a second set of movable mandrels;

c. moving said container into said first station with the first set of movable shoring members in alignment with the external surfaces of said side walls and roof;

d. moving said first set of shoring members into contact with said side walls and roof;

e. extending said mandrel away from said fixed platform into the open area inside of said container to align said second set of shoring members with the internal surfaces of said side walls and roof;

f. said step of extending said mandrel comprising rolling said mandrel from said fixed platform on to said floor of said container, and

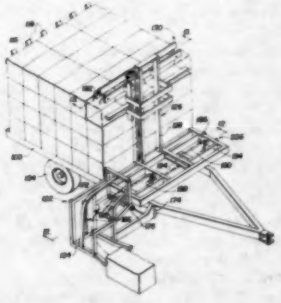
g. moving said second set of shoring members into contact with the internal surfaces of said side walls and roof.

4,370,796

BALE WAGON

Leon R. Wilson, Box 1612, Kalispell, Mont. 59901

Continuation-in-part of Ser. No. 36,574, May 7, 1979, abandoned, and a continuation-in-part of Ser. No. 81,717, Oct. 3, 1979, abandoned. This application Aug. 12, 1980, Ser. No. 177,332
Int. Cl.³ A01D *87/12*
U.S. Cl. 29—564.3 **12 Claims**



1. In a bale wagom comprising:

(a) a generally rectangular and horizontal bed having at a front end thereof a bale reception area for receiving at least one bale;

(b) a bale pick-up mounted on the side of said bed adjacent said reception area for receiving bales at ground level and depositing them on said reception area;

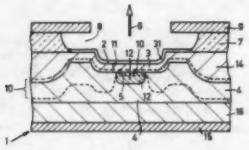
(c) a vertical tower mounted on said bed
(d) tower moving means for moving said tower forwardly and rearwardly along the longitudinal length of said bed said tower having a first position forward of said bale reception area;
(e) a grappler assembly mounted on said tower for receiving and temporarily retaining at least one bale; and
(f) grappler assembly moving means for moving said grappler assembly upwardly and downwardly along the vertical length of said tower,
the improvement wherein said bale wagon further comprises:
(g) binder cutting means for cutting the binder around bales of hay, said binder cutting means comprising:
(i) binder holding means for holding a portion of binder taut;
(ii) a blade;
(iii) a cam and cam follower one of which is operatively connected to said blade; and
(iv) cam and/or cam follower moving means for moving said cam and said cam follower relative to each other, thereby moving said blade against a portion of binder being held taut by said binder holding means.

4,370,797

METHOD OF SEMICONDUCTOR DEVICE FOR GENERATING ELECTRON BEAMS

Gerardus G. P. van Gorkom, and Arthur M. E. Hoeberechts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 84,041, Oct. 12, 1979, Pat. No. 4,303,930. This application May 29, 1981, Ser. No. 268,209
Claims priority, application Netherlands, Jul. 13, 1979, 7905470
Int. Cl.³ H01L *21/223, 21/26*
U.S. Cl. 29—569 R **5 Claims**



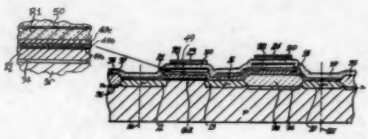
1. A method of manufacturing a semiconductor device for generating an electron beam by avalanche multiplication across a reverse biased p-n junction, said method comprising the steps of:
providing a semiconductor body having a surface, said body having a surface-adjoining n-type conductivity layer and a p-type conductivity layer adjoining the n-type layer, the n-type layer being disposed between the surface of the semiconductor body and the p-type layer, said p-type and n-type layers forming a p-n junction therebetween;
covering the surface of the semiconductor body with a layer of an electrically insulating material;
covering the layer of electrically insulating material with a layer of electrically conductive material;
covering the layer of electrically conductive material with a layer of masking material;
providing an aperture in the mask layer;
etching apertures into the conductive, insulating, and n-type layers through the aperture in the mask layer, the aperture in the conductive layer being larger than the aperture in the n-type layer;
doping the p-type layer through the apertures with acceptor atoms to form a heavily doped p-type region of higher doping concentration than the p-type layer;
removing the mask layer; and
doping the p-type region through the apertures with donor atoms to form a surface-adjoining n-type region in the heavily doped p-type region.

4,370,798

INTERLEVEL INSULATOR FOR INTEGRATED CIRCUIT WITH IMPLANTED RESISTOR ELEMENT IN SECOND-LEVEL POLYCRYSTALLINE SILICON

Jih-Chang Lien, Sugarland, and Te-Long Chiu, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 48,961, Jun. 15, 1979, Pat. No. 4,291,328. This application Jul. 20, 1981, Ser. No. 284,846
Int. Cl.³ H01L *29/04, 29/78*
U.S. Cl. 29—576 B **6 Claims**



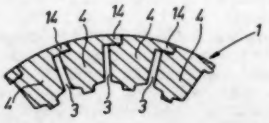
1. A method of making resistor elements in semiconductor integrated circuits, comprising the steps of:
(a) depositing a first level of polycrystalline silicon over the face of a semiconductor body and patterning it to define electrodes of circuit elements on said face and interconnections between electrodes,
(b) forming a triple-level insulator over said first level of polycrystalline silicon, the first level insulator being thermally grown silicon oxide on said first level of polycrystalline silicon, the second level insulator being doped low-temperature deposited silicon oxide densified for smooth step transistors, the third level insulator being undoped low-temperature deposited silicon oxide which acts as a diffusion barrier between the second level insulator and lightly doped resistors in second level polycrystalline silicon,
(c) depositing a second level of polycrystalline silicon on said face and patterning it, the second level partially overlying the first level and overlying some of the circuit elements,
(d) implanting conductivity-determining impurity material into the second level of polycrystalline silicon to provide resistor regions,
(e) introducing conductivity-determining impurity material into selected areas of the second level of polycrystalline silicon to provide connections.

4,370,799

METHOD FOR MANUFACTURING UNFINISHED PARTS FOR PRESSED MATERIAL COMMUTATORS

Joze Potocnik, Idrija, Yugoslavia, assignor to Kolektor p.c., Idrija, Yugoslavia

Filed Nov. 18, 1980, Ser. No. 208,012
Claims priority, application Yugoslavia, Mar. 24, 1980, 817/80
Int. Cl.³ H01R *43/08*
U.S. Cl. 29—597 **4 Claims**



1. A method for manufacturing pressed material commutators from hollow cylindrical copper bodies having an inner surface which includes a plurality of longitudinal grooves

separated by inner ridges at a predetermined spacing, the circumferential widths of said inner grooves being initially larger than the desired ultimate widths thereof, said method comprising:

forming a plurality of longitudinal outer grooves in the outer surface of said cylindrical body, said outer grooves each having a bottom wall spaced radially from the longitudinal axis of said body a distance substantially equal to the radial spacing of the bottom walls of said inner grooves from said longitudinal axis, said outer grooves being staggered circumferentially relative to said inner grooves to define a plurality of yieldable cross-pieces; and

shrinking said body by means of radially inwardly directed forces applied uniformly to the outer surface thereof to break said yieldable cross-pieces, the decrease in the widths of said inner grooves being equal to the widths of said outer grooves.

4,370,800

METHOD OF BALANCING ELECTRICAL MACHINE ROTOR

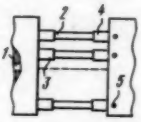
Viktor V. Kuzmin, prospekt Gagarina, 92, kv. 43; Vadim B. Kaplunov, ulitsa Bairona, 138 B, kv. 45, and Boris I. Ljuty, ulitsa Mira, 62, kv. 26, all of, Kharkov, U.S.S.R.

Filed Oct. 29, 1980, Ser. No. 201,905

Claims priority, application U.S.S.R., Nov. 1, 1979, 2829302

Int. Cl.³ H02K *15/02, 15/16*

U.S. Cl. 29—598 **4 Claims**



1. A method of balancing a rotor of an electrical machine comprising the following subsequent steps;

starting the liquid cooling system of the rotor winding formed of parallel hydraulic branches on the body of the rotor;

monitoring the variables of cooling conditions in said branches, with the liquid cooling system under operation, for determining temperature asymmetry in the rotor resulting in heat unbalance of the rotor; and

altering hydraulic resistance in said branches so that the proportion of said variables provide the same magnitude of overheating of the liquid at least in each pair of the diametrically arranged branches of the cooling system.

4,370,801

METHOD OF MAKING A THIN FILM MAGNETIC HEAD ASSEMBLY WITH MULTICONDUCTIVE CONNECTING ELEMENTS

Thomas A. Roscamp, Santa Barbara, and George W. Gibson, Los Olivos, both of Calif., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed Aug. 25, 1980, Ser. No. 180,525

Int. Cl.³ G11B *5/42*

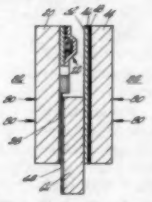
U.S. Cl. 29—603 **13 Claims**

1. A method of making a thin film magnetic head assembly having a substrate, superstrate and thin film magnetic transducer mounted therebetween wherein the thin film magnetic transducer includes a transducing portion located exterior to adjacent edges of the substrate and superstrate and with conductive leads located interior to and extending between the substrate and superstrate comprising the steps of

mounting on a selected surface of a substrate a thin film magnetic transducer with the transducing portion thereof located adjacent one edge of said substrate which intersects with said selected surface;

positioning a preformed planar conductive connecting member having a thickness at least equal to that of the thin film magnetic transducer and formed of an elongated support section and a plurality of spaced, aligned connecting elements extending substantially perpendicular from the elongated support section wherein the connecting elements include a relatively thin diffusable conductive metal coating located on one side thereof with said one side of the connecting elements having said diffusable conductive metal coating thereon in intimate contact with the conductive leads such that a portion of said connecting elements together with the elongated support section of the planar conductive connecting member extend passed an edge of a substrate other than the one edge adjacent the transducing portion of said thin film magnetic transducer;

placing a superstrate having a preformed layer of insulating bonding material affixed to one surface thereof in alignment with the substrate, thin film magnetic transducer and planar conductive connecting member such that the one edge of the superstrate is located adjacent the transducing portion of the thin film magnetic transducer and the one edge of the substrate with the preformed layer of insulating bonding material in intimate engagement with the planar conductive connecting member to form a sub-assembly thereof having a predetermined space between the surface of the superstrate having the preformed layer of insulating bonding material affixed thereto and the selected surface of the substrate, the dimension of the predetermined space being equal to the sum of the thickness of one of the conductive leads, the planar conductive connecting member and the thickness of the diffusable



conductive metal coating thereon, said insulating bonding material being selected of a material which is electrically and magnetically compatible with the thin film magnetic transducer and which has a melting point temperature below a thermal stress temperature at which at least one of the electrical characteristics and the magnetic characteristics of the thin film magnetic transducer are permanently distorted;

controllably heating the sub-assembly in a preselected atmosphere which inhibits oxidation and corrosion of the sub-assembly at a heating rate which permits the thermal expansion of the sub-assembly thereof up to a bonding temperature located in a bonding temperature range between the melting point temperature of the insulating bonding material and below the thermal stress temperature;

during the controllably heating, urging the superstrate and the substrate of the sub-assembly together with a clamping force to form a compression boundary between the surface of the connecting elements having the diffusable metal coating layer in intimate contact with the conductive leads enabling the diffusable conductive metal coating to diffuse into both the conductive leads and connecting elements to form a diffused electrical connection therebetween; and

maintaining the heated and clamped sub-assembly at a bonding temperature within the bonding temperature range for a time period sufficient to enable the insulating bonding material to substantially fill the predetermined space between the substrate and superstrate by capillary action to

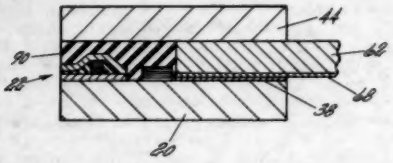
encapsulate and bond said thin film magnetic transducer, connecting elements and the conductive leads having the diffused electrical connection therebetween into a thin film magnetic head assembly.

4,370,802

METHOD OF MAKING A THIN FILM MAGNETIC HEAD ASSEMBLY WITH MULTICONDUCTIVE CONNECTING ELEMENTS

Sanford Piatter, Boulder, Colo., and Pierre Shelley, Santa Barbara, Calif., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed Aug. 25, 1980, Ser. No. 181,089
Int. Cl.³ G11B 5/42
U.S. Cl. 29—603 **11 Claims**



1. A method of making a thin film magnetic head assembly having a substrate, superstrate and thin film magnetic transducer mounted therebetween wherein the thin film magnetic transducer includes a transducing portion located exterior to adjacent edges of the substrate and superstrate and with conductive leads located interior to and extending between the substrate and superstrate comprising the steps of

mounting on a selected surface of a substrate a thin film magnetic transducer with the transducing portion thereof located adjacent one edge of said substrate which intersects with said selected surface;

positioning a preformed planar conductive connecting member having a thickness at least equal to that of the thin film magnetic transducer and formed of an elongated support section and a plurality of spaced, aligned connecting elements extending substantially perpendicular from the elongated support section wherein the connecting elements include a relatively thin diffusable conductive metal coating located on one side thereof with said one side of the connecting elements having said diffusable conductive metal coating thereon in intimate contact with the conductive leads such that a portion of said connecting elements together with the elongated support section of the planar conductive connecting member extend passed an edge of a substrate other than the one edge adjacent the transducing portion of said thin film magnetic transducer;

placing a superstrate in alignment with the substrate, thin film magnetic transducer and planar conductive connecting member such that the one edge of the superstrate is located adjacent the transducing portion of the thin film magnetic transducer and the one edge of the substrate in intimate engagement with the planar conductive connecting member to form a sub-assembly thereof having a predetermined space between the surface of the superstrate and the selected surface of the substrate, the dimension of the predetermined space being equal to the sum of the thickness of one of the conductive leads, the planar conductive connecting member and the thickness of the diffusable conductive metal coating thereon;

placing a quantity of insulating bonding material adjacent the spaced opposed edges and in the vicinity of the transducing portion of the thin film magnetic transducer, said insulating bonding material being selected of a material which is electrically and magnetically compatible with the thin film magnetic transducer and which has a melting point temperature below a thermal stress temperature at which at least one of the electrical characteristics and the magnetic characteristics of the thin film magnetic transducer are permanently distorted;

controllably heating the sub-assembly in a preselected atmosphere which inhibits oxidation and corrosion of the sub-assembly components at a heating rate which permits the thermal stresses of the sub-assembly to be maintained at a level to avoid damage to the sub-assembly during heating thereof up to a bonding temperature located in a bonding temperature range between the melting point temperature of the insulating bonding material and below the thermal stress temperature;

during the controllably heating, urging the superstrate and the substrate of the sub-assembly together with a clamping force to form a compression boundary between the surface of the connecting elements having the diffusable metal coating layer in intimate contact with the conductive leads enabling the diffusable conductive metal coating to diffuse into both the conductive leads and connecting elements to form a diffused electrical connection therebetween; and

maintaining the heated and clamped sub-assembly at a bonding temperature within the bonding temperature range for a time period sufficient to enable the insulating bonding material to substantially fill the predetermined space between the substrate and superstrate by capillary action to encapsulate and bond said thin film magnetic transducer, connecting elements and the conductive leads having the diffused electrical connection therebetween into a thin film magnetic head assembly.

4,370,803

METHOD FOR ENVELOPING THE PLATES OF AN AUTOMOTIVE STORAGE BATTERY WITH SEPARATOR MATERIAL

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 59,258, Jul. 20, 1979, abandoned, which is a continuation of Ser. No. 868,049, Jan. 9, 1978, abandoned, which is a division of Ser. No. 771,569, Feb. 24, 1977, Pat. No. 4,080,732. This application Nov. 20, 1980, Ser. No. 208,756
Int. Cl.³ B23P 15/00, 19/04
U.S. Cl. 29—623.4 **9 Claims**

1. A method for forming lead-acid storage battery separator envelopes from a continuous roll of separator material of the type having ribs thereon, said method comprising the steps of:

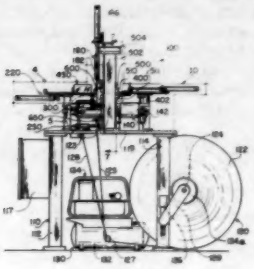
(a) withdrawing separator material from said roll;

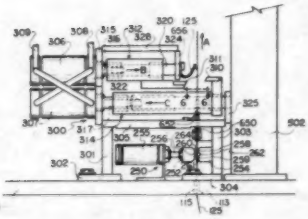
(b) clamping said withdrawn separator material along the length thereof to crush and deform said separator material ribs and produce two creases therein across the width thereof, said creases being spaced from each other approximately the thickness of a pasted battery plate;

(c) releasing said clamping;

(d) introducing the edge of a plate narrower in width than said separator material into contact with said separator

material at said crushed and deformed portion thereof between said spaced creases;





(e) folding said withdrawn separator material along the length of said plate, whereby said material overlaps the edges of said plate; and

(f) sealing said overlapped edges to each other.

4,370,804

ELECTRONIC COMPONENT INSERTING APPARATUS

Yoshihiko Misawa, Katano; Akira Kabeshita, Moriguchi; Kazuhiro Mori; Hiroshi Nakagawa, both of Katano, all of Japan, and Shigeru Araki, deceased, late of Katano, Japan (by Kaeko Araki, administratrix), assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 3, 1980, Ser. No. 183,839

Claims priority, application Japan, Sep. 6, 1979, 54-114500

Int. Cl.³ B23P *23/00*

U.S. Cl. 29—741 **4 Claims**

1. An electronic component inserting apparatus comprising:

means for placing a circuit board into a predetermined position;

an insertion head for carrying a component to be placed on the circuit board;

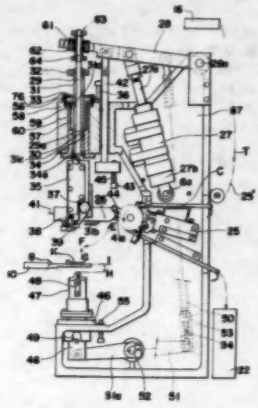
an engaging shaft on which said insertion head is carried and having a ball receiving recess therein;

a machine body having a stationary bushing means therein in which said engaging shaft is slidably mounted for movement in the direction of the axis of said engaging shaft toward and away from a circuit board in said predetermined position, and in which said engaging shaft is rotatably mounted for movement around the axis of said engaging shaft;

a moving means connected to said engaging shaft for moving said engaging shaft reciprocally in the direction of the axis thereof toward and away from a circuit board;

a ball rotatably seated in said recess in said engaging shaft for rolling movement in said recess;

a plurality of cam groove means mounted between said engaging shaft and said bushing means and only one of which is engaged by said ball at any given time said cam groove means having a shape for producing rotational movement of said engaging shaft around the axis thereof during axial movement of said engaging shaft toward and away from a circuit board, each of said cam groove means having a shape for guiding said engaging shaft through an



angle of rotation different from the angles of rotation of the other cam groove means, said cam groove means being interchangeable for changing the rotation angle of said engaging shaft.

4,370,805

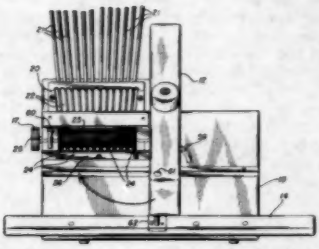
CIRCUIT PACKAGE HANDLING APPARATUS

Wayne K. Pfaff, Irving, Tex., assignor to Plastronics Interconnections, Inc., Irving, Tex.

Filed Oct. 20, 1980, Ser. No. 198,543

Int. Cl.³ B23P *19/00*; **H05K** *3/30*

U.S. Cl. 29—741 **22 Claims**



1. Apparatus for simultaneously loading a plurality of circuit packages in a plurality of receiving sockets comprising:

(a) means for receiving a plurality of circuit packages and directing said packages toward a plurality of loading stations;

(b) metering means for simultaneously transferring one circuit package from each of the receiving and directing means into a loading station wherein said circuit packages occupy the positions with respect to each other that they will occupy when positioned in their respective receiving sockets;

(c) rack means for simultaneously lifting said plurality of circuit packages from said loading stations;

(d) transfer means for moving said rack means from said

loading stations and aligning said circuit packages with said receiving sockets; and

(e) means for simultaneously inserting said plurality of circuit packages into said receiving sockets.

4,370,806

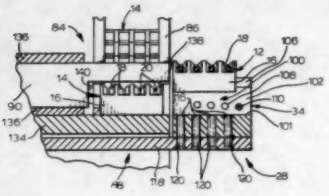
ELECTRICAL HARNESS FABRICATION APPARATUS

Jack F. Funcik, Downers Grove; Joseph C. Bennet, Lisle; Joseph T. Tubbs, Woodridge, and Thomas E. Schneider, Burbank, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 12,715, Feb. 16, 1980, Pat. No. 4,235,015. This application Aug. 11, 1980, Ser. No. 177,108

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—749 **4 Claims**



1. In a machine for making an electrical harness,

said harness comprising at least one connector with contacts loaded therein, each contact connected to a wire,

said machine including a first station whereat a first connector is initially positioned and a completed electrical harness is finally presented,

the improvement comprising:

a connector feed station adjacent to said first station whereat a second connector is positioned prior to being positioned at the first station;

a load and eject assembly associated between said connector feed station and said first station including a reciprocally mounted connector engaging push member having one portion thereof engaging the second connector at the connector feed station and having another portion thereof engaging the first connector of a completed electrical harness at the first station, said connector engaging push member being actuable to move in a direction from the connector feed station toward the first station so that the second connector at the connector feed station is moved to the first station while, at the same time, the completed electrical harness is ejected from the opposite end thereof; and

control means for actuating said load and eject assembly after a completed electrical harness is presented to the first station.

4,370,807

WATER-POWERED, ROTARY HEAD SHAVER

Charles R. O'Neill, 11 Hillside Ave., Roslyn Heights, N.Y. 11577

Continuation-in-part of Ser. No. 972,081, Dec. 21, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,298

Int. Cl.³ B26B *19/34*

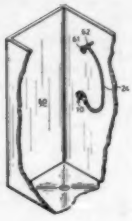
U.S. Cl. 30—41.5 **10 Claims**

3. A water-powered, rotary head shaver, comprising:

a housing including a hollow generally cylindrical shaving head portion defining an interior chamber which is divided into a front chamber segment and an axially-spaced rear chamber segment separated by an intermediate wall, said shaving head portion having at least one opening communicating with said front chamber segment and at least one water outlet port communicating with said rear chamber segment, said housing also having an elongated, generally cylindrical hollow handle portion securely directed adjacent to said shaving head portion which handle portion defines an interior channel which communicates at one end with said rear chamber segment and which handle portion has a water inlet port formed therein which opens into the other end of said interior channel, said handle portion having an axis which is disposed generally normally to the axis of said shaving head portion;

a rotary head grill mounted within said opening of said shaving head portion and disposed generally normally to the longitudinal axis of said shaving head portion;

a drive shaft rotatably mounted within said interior chamber of said shaving head portion and disposed generally parallel to the longitudinal axis of said shaving head portion;



an impeller having a plurality of vanes mounted on said shaft and disposed in said rear chamber segment;

a rotary cutting head coupled to said shaft for rotation therewith and disposed in said front chamber segment adjacent to said rotary head grill for cooperative shearing engagement therewith upon rotation thereof, said rotation of said cutting head being effected upon the introduction of water under pressure through said water inlet port of said handle portion and said channel of said handle portion, following which it impinges upon the vanes of said impeller causing rotation thereof and said drive shaft and, in turn, said cutting head.

4,370,808

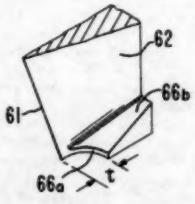
CUTTING TOOL WITH WEDGE SHAPED CUTTING BLADE TO REDUCE FRICTION

Walter J. Maytham, Los Altos, Calif., assignor to Speed Systems, Inc., Waukesha, Wis.

Filed Sep. 29, 1980, Ser. No. 192,072

Int. Cl.³ H02G *1/12*

U.S. Cl. 30—353 **6 Claims**



1. A cutting blade for use in stripping insulation from a cable made up of conductive strands of material, said cutting blade having a front face, a rear face, a cutting edge formed at the intersection of said front face and said rear face an end and a wedge-shaped block of material formed at said end such that the wedge-shaped block of material extends at right angles from said front face, said wedge having a blunt face facing in the same direction as said cutting edge said cutting edge being adapted to cut a portion of the insulation in a helix around the axis of said cable when said blade is rotated about said cable but to leave uncut a small portion of insulation adjacent said con-

ductive strands, said wedge being adapted to lift the uncut insulation beneath the cut insulation from said cable.

4,370,809

POWER CHAIN SAW

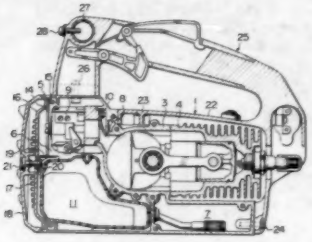
Hiroshi Takahashi, Fussa, and Masatoshi Satoh, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,210

Claims priority, application Japan, Mar. 26, 1980, 55-39841[U]

Int. Cl.³ B27B *17/00*

U.S. Cl. 30—381 **6 Claims**



1. A power chain saw comprising a power unit including a crank-case, a cylinder block, a forwardly extending housing formed integrally with said crank-case and having a space defined thereof, a carburetor disposed in the space and connected to said crank-case in communication with its interior, and a main handle positioned on the power unit on its upper side and extending longitudinally between the rear end and the forward upper portion of the power unit.

4,370,810

PORTABLE MOTOR CHAIN SAW

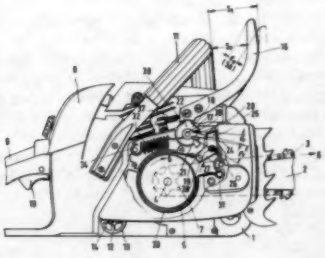
Volker Schurr, Schwieberdingen; Hans Nickel, Burgstetten; Klaus Höppner, Marbach; Gisbert Köhler, Fellbach; Hermann Weiss, Erdmannhausen, and Dieter Wieland, Neckarrems, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,533

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922573

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—382 **19 Claims**



1. A portable motor chain saw, comprising in combination:
a housing;
a braking device, arranged and associated with said housing, for stopping the saw chain during recoil;
a locking mechanism arranged and associated with said braking device; and
a release for said braking device arranged and associated with said housing, at least one holding means for holding said release in its ready position, said release being raised in brake-off position so as to have a spacing from said locking mechanism though able to move along a predetermined acceleration path toward the saw chain in the event of recoil and operatively engageable with said locking mechanism in the release position of said release, said release being an inertial mass which is freely movable along an acceleration path and which is so strongly accelerated during recoil of the motor chain saw that stored kinetic energy of said inertial mass in the release position is greater than the resistance force of said locking mechanism so that such kinetic energy is sufficient to disengage said locking mechanism automatically to overcome the resistance force without delay to assure especially high certainty during release of said braking device without manual actuation thereof being required and independently of angle of incidence of any force encountered therewith.

4,370,811

APPARATUS FOR MARKING PRESELECTED MEASUREMENTS

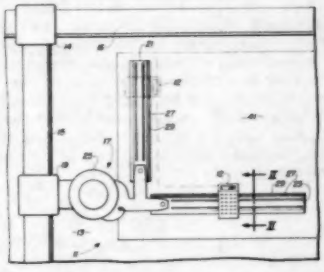
Dennis R. Triggs, 348 E. Fernwood St., Morton, Ill. 61550, and Howard W. Coulter, 12 Oakcrest Dr., Pekin, Ill. 61554

Filed Feb. 9, 1981, Ser. No. 233,010

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.³ B43L *13/00*

U.S. Cl. 33—32 R **10 Claims**



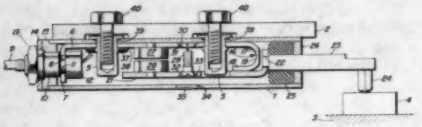
1. Apparatus for marking preselected measurements on an object, comprising:
a housing,
a source of electrical energy operably connected with said housing;
means for receiving and storing preselected data, said data means being a microcomputer operably connected with said housing and connected to said source of electrical energy;
means for engaging and guiding movement of said housing relative to said object in a substantially straight line, said guiding means having calibrations at equally spaced intervals;
means in said housing, connected to said energy source for electrically sensing said calibrations in response to said housing being moved relative to said calibrations and for registering said sensing with said preselected data; and
means in said housing connected with said energy source for marking said object in response to said registered sensing of said calibrations, said marking means being electrically energized for urging a color-impregnated marking medium into repeated momentary contact with said object in a spaced marking pattern corresponding to said preselected stored data.

4,370,812

GAUGING HEAD FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Oct. 27, 1980, Ser. No. 201,223
Claims priority, application Italy, Oct. 29, 1979, 3527 A/79
Int. Cl.³ G01B *7/12*
U.S. Cl. 33—169 R **13 Claims**



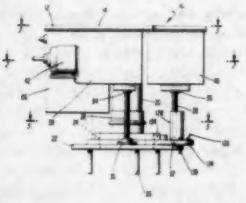
1. A gauging head for checking linear dimensions of mechanical pieces, comprising: an outer casing having lateral external faces that are substantially plane and parallel to a longitudinal geometrical axis of the casing; a movable gauging arm protruding from an end of the casing; a feeler fixed to the gauging arm to contact the surface of the piece to be checked, the feeler being movable along a direction that is substantially perpendicular to said geometrical axis; arm supporting means fixed to the casing; transducer means adapted to provide a signal depending on the position of the feeler; and sealing means for the closure of the casing, wherein said casing basically consists of a single seamless drawn tubular element open at its ends and with four lateral walls having substantially a constant thickness, said supporting means being fixed substantially to a single internal face of the tubular element and including a first longitudinal element fixed to one of said walls of the tubular element, a second element, substantially longitudinal, arranged within the tubular element and carrying the gauging arm and the feeler, and a third connection element connecting the first and the second element, the third element having a section that is resiliently flexible to allow the moving of the second element about said section, and wherein the first and the third connection elements are parts of a single member of bent sheet steel, said sealing means being adapted to seal the ends of the tubular element.

4,370,813

AUTOMATIC SELF-LEVELING INSTRUMENT MOUNT

Edward W. Burniski, 152 Sharp St., Alden Station, Nanticoke, Pa. 18634

Continuation-in-part of Ser. No. 45,692, Jun. 5, 1979, Pat. No. 4,265,027. This application Jan. 21, 1981, Ser. No. 226,643
Int. Cl.³ G01C *5/02*
U.S. Cl. 33—291 **7 Claims**



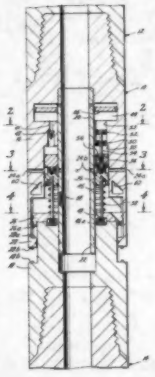
1. A self-levelling mount, comprising:
a table having a surface to be oriented parallel to a reference plane;
a stationary frame member;
a first, fixed length support arm pivotally connected between said table and said frame member;
second and third, variable length support arms connected between said table and said frame member, said second and third variable length support arms being pivotally connected and retained to said frame member by first pivot members, said variable length support arms being coupled to said table through second pivot members;
said first, second and third arms being oriented in a triangular array; and
means for controlling the lengths of said second and third arms to orient said table relative to the reference plane.

4,370,814

WELL TOOL FOR DETECTING WELL BORE DEVIATION IN DRILL STRING

William T. Carpenter, Jr., #3 Colony East, Houston, Tex. 77069

Filed Jul. 18, 1980, Ser. No. 170,048
Int. Cl.³ E21B *47/22*
U.S. Cl. 33—307 **11 Claims**



1. Well tool for detecting well bore deviation, comprising:
(a) a tool adapted to be connected between adjacent components of a drill string, including a longitudinal opening through which drilling fluid can be circulated;
(b) at least one vent hole in the tool wall for communicating the longitudinal opening with the space outside the tool through which drilling fluid is circulated back to the surface;
(c) blocking means for selectively blocking and unblocking the vent hole;
(d) deviation measuring means for measuring the angle the tool has deviated from vertical;
(e) timing and moving means operatively connecting the deviation measuring means with the blocking means for moving the blocking means and unblocking the vent at a time interval after weight is placed on a bit, the time interval being determined by the amount of deviation measured by the deviation measuring means, the unblocking of the vent causing a pressure drop in the drilling fluid in the tool the timing of which indicates the amount of deviation.

4,370,815

NAVIGATION INSTRUMENT

James R. Younkin, Springdale, Ark., assignor to Edo-Aire Mitchell, Mineral Wells, Tex.

Filed Mar. 23, 1981, Ser. No. 246,309
Int. Cl.³ G01C *19/34*
U.S. Cl. 33—318 **17 Claims**

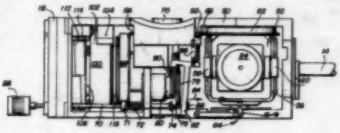
1. An aircraft instrument for generating navigation information comprising:
a first element;

means for coupling said first element to a gyro to be driven thereby;

first transducer means for generating a signal representative of the position of said first element relative to a reference;

a second element;

means for coupling said second element to said first element for co-movement therewith, said means for coupling including means for de-coupling and relatively rotating said second element with reference to said first element;



second transducer means for generating a signal representative of the position of said second element relative to said reference; and

means for generating a signal varying with the differential between said first and second transducer means signals and varying with the relative position of said first and second elements.

4,370,816

CLOSED-CIRCUIT CONDENSATION PURIFIER FOR GASEOUS FLOWS CONTAINING SOLVENTS AND MOISTURE

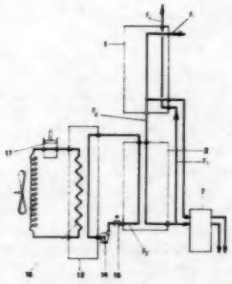
Alessio Zambelli, Treviso, Italy, assignor to VE.DA. S.r.l, Italy

Filed Oct. 27, 1980, Ser. No. 201,379

Claims priority, application Italy, Jan. 3, 1980, 82501 A/80

Int. Cl.³ F26B *11/04, 21/08*

U.S. Cl. 34—76 **10 Claims**



1. A closed circuit purification system for gaseous flows containing water and solvent vapors coming from a primary machine, comprising: a gas/gas heat exchanger receiving the gaseous flow from the primary machine for cooling it to such a temperature that substantially all the water vapor therein is converted to liquid, a gas/liquid heat exchanger receiving the gaseous and liquid flow coming from the gas/gas heat exchanger for freezing the water and condensing the solvent vapor, and a cooling circuit operatively connected to the gas/liquid heat exchanger and further cooling the gaseous flow therein, whereby the purified gaseous flow leaving the gas/liquid heat exchanger is returned into the gas/gas heat exchanger for cooling therein the incoming gaseous flow from the primary machine and being warmed itself.

4,370,817

ELEVATING BOOT

Karl S. Ratanangsu, 7752 Bellaire Ave., North Hollywood, Calif. 91605

Filed Feb. 13, 1981, Ser. No. 234,308

Int. Cl.³ A43B *7/16*

U.S. Cl. 36—81 **3 Claims**

1. An elevating boot comprising:

a sole having a fore end and an aft end and a top surface and a first bottom surface;

a heel secured to said first bottom surface of said sole at said aft end, said heel having a second bottom surface, said first and second bottom surfaces to be substantially on the same plane;

a covering attached to said sole encasing said top surface of said sole, said covering being adapted to enclose the wearer's foot forming an enclosing chamber when positioned against said top surface of said sole;

a tubualr extension attached to said covering, said tubular extension being open ended and adapted to be located about the ankle of the wearer, the forward most section of said tubular extension to be in tight contact with the ankle of the wearer to prevent forward motion of the wearer's foot during walking;

a first insert mounted on said aft end of said sole and encased by said covering, said first insert having an upper inclining surface, said upper inclining surface to extend from directly adjacent said top surface of said sole to a spaced distance above said top surface at said aft end;

said enclosing chamber at said fore end including a second insert which is to be located forward of the wearer's foot, said second insert makes it appear that the size of the foot is larger to be in proportion to the appearance of the appearance of the increased height of the wearer due to the combination of the height of the heel and said first insert; and

a connecting section connected between said first and second inserts.

4,370,818

PROTECTIVE FOOTWEAR

Arthur Simoglou, 2014 Plant Ave., Redondo Beach, Calif. 90278

Filed Dec. 15, 1980, Ser. No. 216,690

Int. Cl.³ A43B *3/24, 23/26*

U.S. Cl. 36—100 **13 Claims**

1. Protective footwear comprising:

a shoe portion having an upper, a sole and a foot-receiving opening;

said foot-receiving opening including an elongate U-shaped opening forward of said foot-receiving opening adapted for permitting easy entry of a foot into said shoe portion;

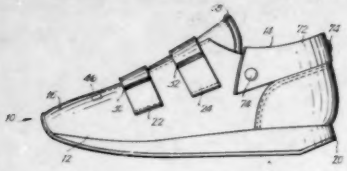
a foot-protecting insert portion effective to encase a foot in a resilient protective layer;

said shoe portion being adapted for receiving a foot encased in said insert portion;

first fastening means adjacent a portion of said foot-receiving opening; and

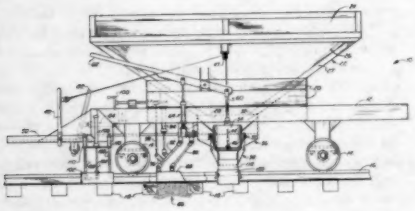
second fastening means complementary to said first fastening

means and effective for removable attachment of said insert portion in said shoe portion;
said second fastening means including a collar on said insert



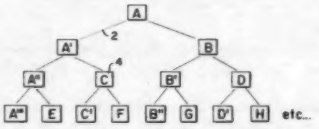
portion; said collar being foldable over a perimeter of said foot receiving opening to contact an outside surface of said upper and being effective to bring said first and second fastening means into interengageable positions.

4,370,819
APPARATUS FOR DEPOSITING AND SPREADING BALLAST
Robert E. Ingram, 726 Okuma Dr., Chester, Va. 23831
Filed Mar. 24, 1981, Ser. No. 247,213
Int. Cl.³ E02F 5/22
U.S. Cl. 37—104 **4 Claims**



1. An apparatus for depositing and spreading ballast between and exteriorly of railroad rails and cross ties which comprises:
a. a frame mounted on wheels with said wheels engageable with said railroad rails,
b. hopper means supported by said frame,
(1) said hopper means having an open top and an open bottom and being adapted to receive said ballast,
(2) said hopper means having laterally extending chute means in fluid communication therewith with said chute means including a fixed chute means with inlet means positioned beneath the open bottom of said hopper means and laterally extending hollow portions extending in opposite directions toward a respective one of said railroad rails and a pair of movable chute means one of which is pivotally secured adjacent the ends of said hollow leg portions,
c. first door means located beneath said hopper means to control the deposit of ballast between said rails,
(1) said first door means being mounted in a horizontal plane and being extendable through slot means provided in said fixed chute means,
d. second door means to control the deposit of ballast exteriorly of said rails,
(1) said second door means being mounted for vertical movement within said laterally extending chute means at the juncture between said fixed chute means and said pair of movable chute means,
e. first blade means resiliently mounted beneath said frame engageable with ballast deposited between said rails,
f. and second blade means resiliently mounted beneath said frame engageable with ballast deposited exteriorly of said rails on the heads of the cross ties.

4,370,820
SELECTIVELY INTERCONNECTABLE INFORMATION CARD HOLDER ARRANGEMENT
Pierre Y. Tschanz, 10, rue Emile-Yung, CH-1205 Geneva
Continuation-in-part of Ser. No. 934,490, Aug. 17, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,043
Claims priority, application Switzerland, Aug. 18, 1977, 10153/77
Int. Cl.³ B42F 17/00
U.S. Cl. 40—388 **8 Claims**



1. A device for the detachable arrangement of information carriers (6) whose information is an element of an ordered thought, or organization diagram in an order of alternatives and subalternatives,
wherein each information carrier (6) comprises an essentially rectangular card-like element,
and comprising
a double-wall (16*f*, 16*r*) connecting card-holder element (16) having
two lateral pocket-like portions (42, 44),
a central cut-out or opening (34) located between the lateral pocket-like portions, the dimension or the two lateral portions and the central cut-out together matching approximately the shape and size of the essentially rectangular card-like information carrier (6),
a central pocket-like portion (40) of approximately the same size as the central opening or cut-out (34) and projecting in alignment with the central opening, to permit fitting a pocket-like portion (40') of a further similar, adjacently located connecting card holder element positioned in the plane of the said connecting card holder element (16) into the central opening (34) thereof and permit insertion of the card-like information carrier element (6) through the lateral pocket-like portions (42, 44) of said connecting card holder element and the central pocket-like projecting portion (40') of the further adjacently located connected card holder element;
said information carrier element (6) simultaneously providing the information carried thereon as well as forming the connection between two adjacent connecting card holder elements located in the same plane;
and wherein the connecting card holder element further comprises three side pocket portions (50, 52, 54) located in alignment along the narrow side of the connecting card holder element,
and an elongated flexible strip 6' insertable simutaneously through the two outer side pocket-like portions (54, 50) of said connecting card holder element and through the inner pocket-like portion (54, 50) of an additional, similar superimposed connecting card holder element
said elongated strip (6') thus producing a connection between two superimposed connecting card holder elements.

4,370,821

ROTARY MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS

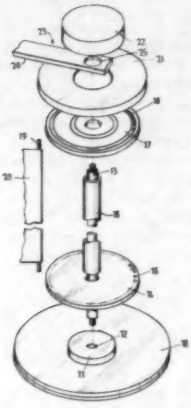
Falk J. Eichner, Coburg, Fed. Rep. of Germany, assignor to Eichner Organization KG, Coburg, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,654

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016190

Int. Cl.³ G09F *11/02*

U.S. Cl. 40—497 **2 Claims**



1. A rotary magazine assembly for holding information bearing cards and the like having support pins attached along one of the sides of the cards, comprising, a vertical axle having a support base, a pair of spaced plates rotatably mounted on said axle, an upper disc having a central aperture overlying an upper one of said plates, said plates each having opposed openings therein, opposite ends of said support pins pivotally engaging said opposed openings to permit pivotal movement and separation of the cards about the axes of said pins, said plates and said pins, together with the cards, thereby being rotatable about the central axis of said axle, a device comprising a horizontally disposed support arm mounted on said axle above said disc for rotation about said central axis, said device further comprising a vertically disposed guide pin overlying the cards and extending through an opening in said arm for vertical sliding movement, a stop element attached to one end of said pin and being spaced from said arm while extending in one position under gravity into a selected space between a pair of the cards when separated, and said device further comprising a finger gripping element attached to an opposite end of said pin for maintaining said stop element in said one position, whereby said device maintains the pair of cards separated and arrests the rotary movement about said central axis when it is desired to retrieve information therefrom with said stop element in said one position, said stop element being moved into a second raised position upon elevation of said finger gripping element to permit the cards to again be rotated about said central axis.

4,370,822

CONVERTIBLE FIREARM-AIRGUN

Villarosal A. Rabino, 28 Frankfort St., Daly City, Calif. 94104

Filed Jun. 12, 1980, Ser. No. 158,968

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—1 R **23 Claims**

1. A convertible firearm-airgun comprising:

a barrel having a muzzle end and a chamber end and defining a bore therethrough between said muzzle end and said chamber end;

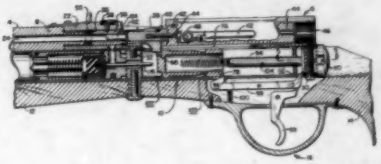
a bolt housing having a bolt cavity therein;

means for mounting said bolt housing to the chamber end of said barrel with said bolt cavity aligned with said bore;

a first chamber device defining a first chamber, said first chamber configured for chambering a cartridge therein, said first chamber device including a firing pin;

a second chamber device defining a second chamber, said second chamber configured for chambering a compressed-gas projectile therein;

means for selectively mounting either said first or said second chamber devices adjacent the bore at the chamber end of the barrel;



a first bolt assembly configured to be housed within said bolt cavity and adapted to movably engage the head of a cartridge chambered within said first chamber;

a second bolt assembly configured to be housed within said bolt cavity and adapted to movably engage an end of said second chamber;

a compressed gas chamber;

means for selectively fluidly connecting said compressed gas chamber and said second chamber when said second chamber device is mounted adjacent said bore; and

means for actuating either said firing pin when said first bolt assembly is mounted within said bolt cavity or said selective fluid connecting means when said second bolt assembly is mounted within said bolt cavity.

4,370,823

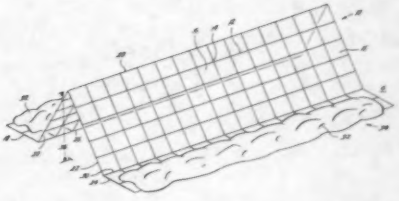
SNAKE TRAP

Albert B. Moorhead, P.O. Box 413, Conroe, Tex. 77301

Filed Mar. 10, 1980, Ser. No. 128,399

Int. Cl.³ A01K *69/02, 71/00, 74/00*

U.S. Cl. 43—7 **7 Claims**



1. A device for the trapping of snakes comprising:

a sheet of unitary netting having at least four areas of netting;

said netting formed with interstices larger than the head of the snake to be trapped and smaller than the largest cross section of the snake to be trapped;

said netting areas being serially adjacently connected;

the first and last of said netting areas being non-adjacent and substantially co-planar to be placed substantially flat on the ground; and

the remaining of said at least four netting areas disposed at an angle to each serially adjacently connected netting area and forming at least one open space therebelow which is defined by the remaining of said at least four netting areas.

4,370,824

AERIAL DEVICE

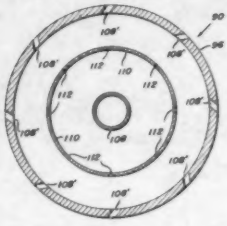
Herbert Resnicow, 107 Weeks Rd., East Williston, L.I., N.Y. 11596

Filed Feb. 23, 1977, Ser. No. 771,279

The portion of the term of this patent subsequent to Oct. 18, 1996, has been disclaimed.

Int. Cl.[2] **A63H** *27/00*; **B64C** *3/12*

U.S. Cl. 46—74 D **1 Claim**



1. An aerial device designed to sail in the air when thrown in a manner such that rotation is imparted to the device, said device comprising, a disc having a top side and an underside, a downwardly extending skirt attached to the peripheral edge of said disc, air passageways in said skirt permitting air to be drawn into the underside of said disc upon rotation of said disc in flight, and at least one cylindrical wall extending downwardly from the underside of said disc to form an air cavity, said cylindrical wall having openings therein whereby the air is drawn in from said passageways in said skirt due to the rotation of said device and is forced inwardly through said openings toward the center of the underside of said device and then downwardly to enhance lift.

4,370,825

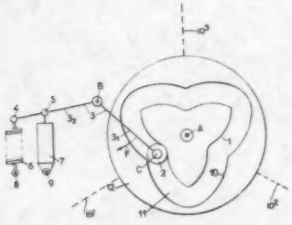
DEVICES OF THE TURNSTILE KIND FOR CONTROLLING PASSAGES REQUIRING AUTHORIZATION

Jean-Pierre Ulmann, Paris, France, assignor to Etablissements Georges Klein, France

Filed May 19, 1980, Ser. No. 151,457

Int. Cl.[3] **E06B** *11/08*

U.S. Cl. 49—47 **2 Claims**



1. A turnstile for controlling the passage of people through a narrow opening by means of mechanical barriers adapted to obstruct at will this opening, comprising a rotary barriers-carrying member, and return means for automatically bringing the rotary member, after each passage causing retraction of a barrier, back towards a stable angular position in which a new barrier obstructs the passage, these return means comprising a first star-shaped cam angularly interlocked with the rotary member and a return roller, applied resiliently against this first cam, a second cam which delimits with the first cam a groove of constant width generally equal to the width of the said roller, thus adapted to jointingly encircle this roller, so that the directions of application of the roller against the respective cams are opposite, i.e. that the contact of the roller against the second cam opposes the loss of contact between the roller of the first cam, said roller being carried by a lever pivotally mounted about a lever axis parallel to the axes of the cams, said lever being associated, on the one hand, with resilient means for urging it angularly about said level axis in the direction corresponding to the application of the roller against the first cam, and on the other hand, with means for damping its angular movement.

4,370,826

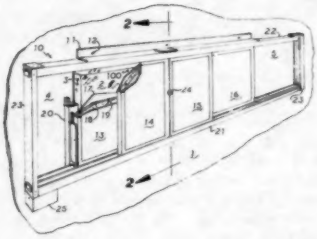
SHUTTER SHIELDS (R), AUTO-MATED THERMAL SHUTTERS FOR GLASS AREAS

James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055

Continuation of Ser. No. 94,910, Nov. 16, 1979, abandoned, which is a continuation of Ser. No. 77,000, Sep. 19, 1979, abandoned, Ser. No. 64,354, Aug. 7, 1979, abandoned, Ser. No. 48,394, Jun. 14, 1979, Ser. No. 39,448, May 16, 1979, abandoned, Ser. No. 828,437, Aug. 29, 1977, abandoned, Ser. No. 39,449, May 16, 1979, Pat. No. 4,267,666, Ser. No. 912,186, Jun. 5, 1978, abandoned, and Ser. No. 776,448, Mar. 10, 1977, abandoned. This application Jan. 23, 1980, Ser. No. 114,662

Int. Cl.[3] **E05B** *65/04*

U.S. Cl. 49—63 **7 Claims**



1. An improved building structure with upright walls having a glass area means commonly called a window or glass sliding door installed therein, said glass area means including a frame and a glass panel means mounted in said frame, in combination with an insulated shutter shield device having upper and lower track means spaced inwardly of said glass area at least one height dimension of said glass area frame and attached to the internal wall structural framing of said building wall structure and parallel to the plane of said glass area means;

laminate insulative shutter shield means mounted in said track means for movement between positions adjacent to the side of said glass area means and in front thereof, to block off the entirety of said glass area means, low friction means for supporting said laminate insulative shutter shield means for movement on said track means,

said laminate insulative shutter shield means having rigidifying means and an insulative material layer mounted side by side, said insulative material having little resistance against breakage when forces are applied in the direction perpendicular to the plane thereof, said rigidifying means providing a rigidification of said insulative material against the effects caused by forces applied from the outside, and seal means for effecting a seal around the periphery of said glass area means and between said glass area means and said insulative shutter shield means, thereby defining a sealed chamber;

said improved insulative shutter shield device having a motorized means for traversing said insulative shutter shield means to an opened or closed mode,

wherein the improvement comprises:

said traversing means having a motorized, threaded drive

shaft means maintained in a mode of rotatable precision alignment housed in said lower track means;

a drive slide block means having a shutter drive pin means installed therein, extending vertically at right angles to said drive slide block means, said drive slide block means is threadedly disposed in a non-rotatable mode on said threaded drive shaft means; and

at least one insulated shutter shield means is installed in said track means engaging said vertical extending shutter drive pin means; whereby

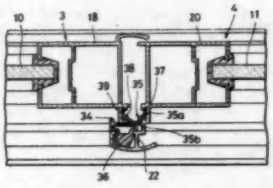
said motorized traversing means opens or closes said insulated shutter shield.

4,370,827

WEATHERTIGHT DOOR ASSEMBLY

Kozo Furuminato, Kurobe, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,713
Claims priority, application Japan, Aug. 10, 1979, 54-109457
Int. Cl.³ E06B 7/16
U.S. Cl. 49—368 **4 Claims**



1. A weathertight door assembly comprising:

(a) an outer frame adapted to be mounted within an opening in a building wall, said outer frame including a header, a sill, and a pair of side jambs connected to said header and sill at their ends to define a door opening;

(b) a pair of doors pivotably supported on said pair of side jambs, respectively, for jointly closing said door opening, each of said doors including a panel and an inner frame extending along and embracing the periphery of said panel, said inner frame including a pair of upper and lower horizontal frame members and a pair of inner and outer vertical frame members, one of such two inner vertical frame members having a projection extending therealong for covering a gap between said inner vertical frame members when said doors are closed, said projection having a pair of cut-aways one at each vertical end;

(c) first sealing means supported on said outer frame along such door-opening-defining inside edges thereof for sealing gaps between said outer frame and the periphery of said pair of doors when the latter is closed, said first sealing means being permitted by said cut-aways of said projections to come into contact with the periphery of said pair of doors when the latter is closed; and

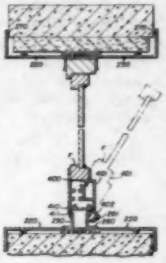
(d) a pair of coacting second and third sealing means on one of said doors for sealing a gap between said inner vertical frame members when said doors are closed, said second sealing means being supported on said projection of said one inner vertical frame member and coextending with the length of said projection, said third sealing means being supported on said one inner vertical frame member and coextending with the length thereof, said third sealing means, when said doors are closed, being sandwiched partly between said second sealing means and the other inner vertical frame member and partly between the latter and said first sealing means.

4,370,828

WINDOW FRAME ASSEMBLY

Carl F. Miro, 1805 Atoka Avenue, Youngstown, Ohio 44511

Division of Ser. No. 914,568, Jun. 12, 1978, Pat. No. 4,246,731, which is a continuation-in-part of Ser. No. 765,262, Feb. 3, 1977, abandoned. This application Oct. 14, 1980, Ser. No. 196,594
Int. Cl.³ E06B 3/38, 1/04
U.S. Cl. 49—383 **12 Claims**



1. A frame assembly for reception of a window in a window opening formed in a wall, comprising:

(A) a pair of rigid frame sections each having

(1) opposed top and bottom components and

(2) opposed end components interconnecting said top and bottom components adjacent their ends to form a rectangular frame section;

(B) locking means carried by at least some of said components in opposed relationship for engagement with each other and interconnection of said frame sections;

(C) sealing means disposed on said top, bottom and end components of said frame sections;

(D) at least some of said sealing means being interconnected to said frame of the window by intermediate means;

(E) said top, bottom and opposed end components have elongate channels opening into facing edge surfaces thereof; and

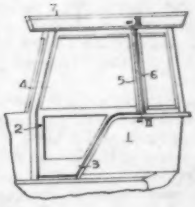
(F) a non-heat conducting connector is provided for engagement within said channels.

4,370,829

SELF-ALIGNING VEHICLE DOOR HINGES

Robert J. Wagner, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 3, 1980, Ser. No. 193,602
Int. Cl.³ E05D 7/08
U.S. Cl. 49—388 **7 Claims**



1. Self-aligning door hinges for a vehicle comprising, a door pillar, a spherical bushing defining a central opening, a socket mounted on said pillar receiving said spherical bushing for universal movement of said spherical bushing, a door, a shaft connected to said door and extending from said door for reception in said sperical bushing forming a hinge of universal movement between said door and said pillar, first sleeve means

mounted on said door pillar, means defining a door supporting surface on said first sleeve means, second sleeve means including a mating door carrying surface mounted on said door, a pin positioned in said first and second sleeve means when aligned thereby providing a hinge between said pillar and door and defining with the spherical bushing hinge the hinge axis on said door.

4,370,830

SLIDING WINDOW

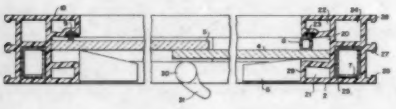
Hans Schaefer, Cologne, and Wolfgang Budich, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 7, 1980, Ser. No. 194,815

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024555

Int. Cl.³ E05D *15/06*

U.S. Cl. 49—413 **35 Claims**



1. A sashless sliding window which includes a frame to be mounted in a wall of masonry, wood, or the like, the frame comprising a plurality of frame profile members joined at corners of the frame, and glass panes adapted to be inserted in the frame, means are provided in the frame for displacably guiding at least one of the glass panes in a horizontal direction, characterized in that each of the frame members is made of an extrudable synthetic resinous material and has a substantially U-shaped cross sectonal configuration with legs of the U-shape being formed by two projections, each of the two projections being fashioned as a hollow chamber, the guiding means includes an undercut mounting groove arranged at least in an upper and lower profile member of the frame between the two projections for accommodating the glass panes, a web means is provided for connecting the two projections to each other, the web means is formed by two juxtaposed additional hollow chambers, means are provided in one of the additional hollow chambers facing a weather side of the window for draining the undercut mounting groove, and in that the guiding means further includes a sliding rail means arranged at least in the undercut mounting groove of the lower profile member of the frame for facilitating a horizontal displacement of the at least one of the glass panes.

4,370,831

RF SHIELDED DOOR SEAL

William H. Hamilton, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 28, 1980, Ser. No. 211,322

Int. Cl.³ E06B *7/16;* **H05K** *9/00*

U.S. Cl. 49—477 **22 Claims**

1. In a wall construction having a peripheral seal for a door;

a door frame on which the door is mounted to move from open and closed positions;

an opening through said frame for passage when the door is in the open position;

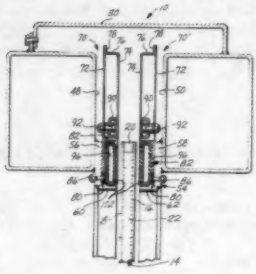
sealing means extending between and along opposing face portions of said door and frame to form a seal between the door and the frame when the door is closed, the door having peripheral edges transverse to said sealing means and to said opposing face portions of the door and frame;

the improvment comprising:

said sealing means having a first sidewall diaphragm movable toward and away from said door when the door is in the closed position to form and break a seal between said door and said sealing means, and a second sidewall diaphragm movable toward and away from said frame when the door is in the closed position to form and break a seal between said frame and said sealing means;

said peripheral edges on said door being transverse to said first sidewall diaphragm forming said seal between the door and sealing means;

operative means within said sealing means to move said first sidewall diaphragm to form the seal on the door and to



break the seal on the door, and to move the second sidewall diaphragm to form the seal on the frame and to break the seal on the frame, said operative means comprising a substantially continuous expandable tubular bladder; and

pulling means associated with said sealing means for holding said first sidewall in an unsealing position and for retracting first sidewall from a sealing position when said expandable bladder is unexpanded.

4,370,832

WEATHERSTRIP FOR VEHICLE CLOSURE

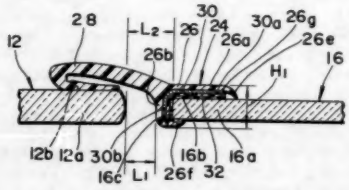
Shouichi Koike, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., No. 2, Yokohama, Japan

Filed Jul. 23, 1981, Ser. No. 286,230

Claims priority, application Japan, Aug. 27, 1980, 55-118705

Int. Cl.³ E06B *7/16*

U.S. Cl. 49—488 **6 Claims**



1. A weatherstrip for providing a seal between first and second movable window glass panels of an automotive vehicle, comprising:

a resilient base portion of a substantially L-shaped section having two legs adapted to engage at the interior surfaces thereof a marginal interior surface portion and a peripheral end surface portion of said first window glass panel, respectively;

a resilient lip portion integral with and extending from said base portion toward said second window glass panel and self-biased with its resilience toward said second window glass panel so that it is sealingly engageable with a marginal interior surface portion of said second window glass panel; and

a substantially rigid core member embedded in said base portion and being of a substantially L-shaped section

having two legs substantially parallel to the interior surfaces of said legs of said base portion, respectively;

said legs of said base portion being cemented at the interior surfaces thereof to the marginal interior surface portion and the peripheral end surface portion of said first window glass panel, respectively.

4,370,833

SEALING ARRANGEMENTS IN THE FORM OF STRIPS

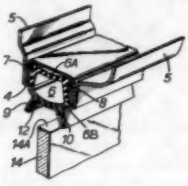
Gerd Niemanns, Grefrath, Fed. Rep. of Germany, assignor to Draftex Development A.G., Zug, Switzerland

Filed Dec. 23, 1980, Ser. No. 219,580

Claims priority, application United Kingdom, Jan. 5, 1980, 8000343

Int. Cl.³ E06B 7/16

U.S. Cl. 49—489 **12 Claims**



1. A sealing strip arrangement for sealing against a distal edge of a movable member, comprising,

a substantially rigid supporting channel,

a hollow tube of resilient and flexible material mounted within the supporting channel so as to fill, and having an external surface which is substantially flush with, the longitudinal mouth of the supporting channel,

and

two flexible and resilient leaves running along the tube's external surface which fills the longitudinal mouth of the supporting channel, the leaves being attached to the said surface of the tube at positions substantially inwardly of the distal edges of the side walls of the supporting channel and being adjacent and aligned with each other so as to define between them a longitudinally shaped open mouth for receiving the distal edge of the movable member, the movable member when it moves into the said mouth tending to flatten the tube thereby causing the leaves to press against the sides of the said member adjacent its distal edge while maintaining the tube in contact with the side walls of the supporting channel adjacent the latter's longitudinal mouth.

4,370,834

MACHINES FOR GRINDING TOOTHED CUTTING TOOLS

Robert Habib, 36,quai Gustave Ador, 1207 Geneva, Switzerland

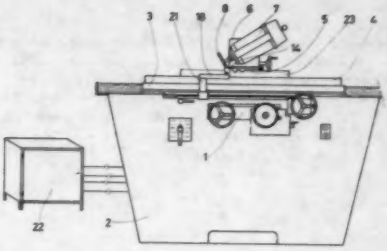
Filed Nov. 12, 1980, Ser. No. 205,910

Claims priority, application Switzerland, Nov. 16, 1979, 10249/79

Int. Cl.³ B24B 49/00

U.S. Cl. 51—165.72 **8 Claims**

1. A machine for grinding toothed cutting tools comprising: a sliding table for supporting a tool to be ground, a grinding wheel support head which is movable transversely with respect to the table and which is tiltable, a grinding wheel supported by said support head, and means for locating and positioning the table relative to the grinding wheel, said positioning means comprising an emitter capable of emitting a ray of energy and a receiver for receiving the ray of energy and for developing an output signal for controlling the movement of the table, and the emitter and receiver being mounted so that the emitted ray can be intercepted by a tooth of the cutting tool to be ground to change the receiver output signal to indicate



the position of the tool to be ground to enable control of the table position.

4,370,835

WORKING PRESSURE CONTROL MECHANISM

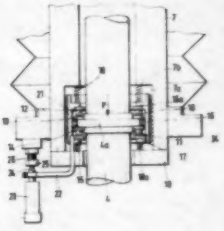
Christian von Schneidemesser; Paul G. Nowotka, and Gerhard Rüdel, all of Rendsburg, Fed. Rep. of Germany, assignors to Peter Wolters, Rendsburg, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,827

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950881

Int. Cl.³ B24B 49/10

U.S. Cl. 51—165.77 **1 Claim**



1. A working pressure control mechanism for lapping, honing, and grinding machines having a rotatably mounted shaft bearing the tool within an axially translatable housing such that the shaft is carried along by the housing in the direction of the tool advance, comprising

a spring means capable of axially translating the housing;

a signal producing means capable of producing a signal corresponding to the magnitude of axial displacement caused by the workpiece and connected to said spring means;

a mechanism advance control means capable of receiving a signal from said signal producing means, and advancing the housing to compensate for the degree of axial displacement; and

wherein the shaft is rotatably mounted in a first bushing which is parallel to the axis of the shaft; said first bushing being disposed inside the housing, which housing is a hollow piston rod; said first bushing having at least one region, defined by thin wall rings, along its length which is elastically deformable by the force applied to it due to the advancing motion of the hollow piston rod, and which region contains mounted therein at least one strain gauge strip whose electrical resistance varies with changes in its length; said strip being connected to the input of an electrical comparator which controls the advancing force of

the hollow piston rod and by it, through the shaft, the tool.

4,370,836

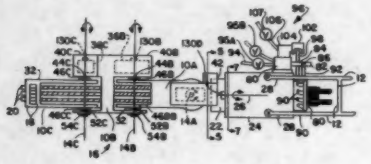
UNIVERSAL ABRASIVE CLEANING APPARATUS

Wayne B. Hockett, 1701 E. Sligh Ave., Tampa, Fla. 33610

Continuation-in-part of Ser. No. 13,376, Feb. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 746,493, Dec. 1, 1976, Pat. No. 4,139,970, which is a continuation-in-part of Ser. No. 614,191, Sep. 7, 1975, Pat. No. 4,027,433. This application Aug. 25, 1980, Ser. No. 180,804

Int. Cl.³ B24C *3/00*

U.S. Cl. 51—410 **5 Claims**



1. An apparatus for spraying a work surface with material under pressure from a remote control surface with material under pressure from a remote control source of material and pressure, comprising in combination:

a base;

a first arm having a channel disposed therein along the length of said first arm;

a first means for rotatably mounting said first arm relative to said base enabling said first arm to rotate about a first axis of rotation;

a second arm having a channel disposed therein along the length of said second arm;

a second means for rotatably mounting said second arm relative to said first arm enabling said second arm to rotate about a second axis of rotation;

a third means for rotatably mounting said first arm relative to said base about a third axis of rotation;

said third axis of rotation being disposed substantially perpendicular to said first axis of rotation;

said third means for rotatably mounting said first arm including a housing;

said third means further including a drum rotatably mounted in said housing;

said third means further including means for connecting said housing to said base;

said third means further including means for imparting rotational movement to said drum; and

means for connecting said first means to said drum.

4,370,837

ARRANGEMENT FOR SELECTIVELY CHANGING THE RADIATION AND VIBRATION TRANSMISSION PROPERTIES OF PANELS

Constancio Larguia, 1175 Talcahuano, Buenos Aires, Argentina

Continuation of Ser. No. 961,852, Nov. 17, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 217,097

Claims priority, application Argentina, Nov. 22, 1977, 270073

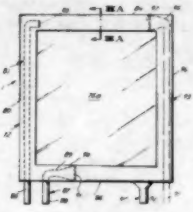
Int. Cl.³ E04C *1/42*

U.S. Cl. 52—1 **29 Claims**

1. In an arrangement for selectively varying the radiation and vibration transmitting properties of panels usable in buildings and other structures, comprising a panel having two substantially parallel sheets of transparent or translucid material mounted in a supporting frame, said two sheets being spaced apart and defining therebetween an intermediate space for receiving, from a reservoir, low density solid particulate material having predetermined thermal and/or optical characteristics; the improvement comprising:

first inlet means disposed in the upper part of said intermediate space for introducing fluidized particulate material into said intermediate space to fill at least a portion of said intermediate space so as to render said portion of said intermediate space less radiation transmissive,

outlet means vertically spaced below said first inlet means for removing said particulate material filling said portion of said intermediate space and returning same to the reservoir, and



second inlet means disposed at substantially the same level as said outlet means and horizontally spaced from said outlet means for introducing air only into said intermediate space and for urging said particulate material toward said outlet means;

whereby, during and after filling of said intermediate space, said air introduced by said second inlet means levels the particulate material introduced by said first inlet means, and, during removal of said particulate material, said air introduced by said second inlet means urges said particulate material toward said outlet means.

4,370,838

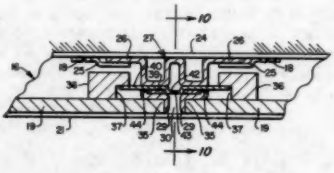
CURTAIN WALL

Eugene F. Vermillion, Columbus, Ohio, assignor to The Columbus Show Case Company, Columbus, Ohio

Filed Aug. 14, 1980, Ser. No. 178,148

Int. Cl.³ E04H *1/00*

U.S. Cl. 52—36 **7 Claims**



1. A wall comprising:

(a) a pair of opposed, elongated channel-form frame members disposed in vertically spaced apart, generally coplanar relation and defining, respectively, upper and lower channels opening toward one another, said lower channel being shallower than said upper channel;

(b) a plurality of vertically arranged, horizontally spaced apart, hollow-form, studs of integral, one-piece construction having upper and lower end portions extending, respectively, into said upper and lower channels, each of said studs including longitudinally coextensive, outward projecting, panel-separating means;

(c) a rectangular wall panel extending between said channel-form frame members and spanning the space between a pair of said studs and having opposite side edges disposed in substantial abutment with the panel-separating means of

each of said pair of studs, and having catch means disposed adjacent a side edge thereof, said panel and studs having length dimensions permitting their ready removal from said channel-form frame members simply by lifting their lower ends above and moving them outwardly from said lower channel; and

(d) a manually operable latch carried by at least one of said studs and accessible through a slot formed in the panel-separating means of the stud, said latch being selectively movable to engage the catch means of said panel and thereby lock said panel to the stud.

4,370,839

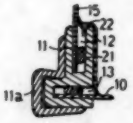
POOL CONSTRUCTION

Stanley R. Blakeway, Stafford Heights, Australia, assignor to Blakeway Marviroll Pools Pty. Ltd., Queensland, Australia

Filed Feb. 15, 1980, Ser. No. 121,786

Int. Cl.³ E04H *3/16*

U.S. Cl. 52—169.7 **3 Claims**



1. A swimming pool construction comprising:

(a) a horizontal bottom section of pliable vinyl-coated sheet steel material configured to the desired shape of the pool,

(b) a substantially vertical wall section of pliable vinyl-coated sheet steel material, said vertical wall section being joined at the contiguous ends thereof and configured, in plan view, complementary to the configuration of said horizontal bottom section,

(c) a flexible junction member comprising a single length of material curved to the configuration of said bottom section, and means for connecting the contiguous ends of said junction member, said junction member being generally L-shaped in cross-section, its lower part being formed with a horizontal parallel sided first groove open to the interior of the pool to receive the periphery of the bottom section, its upright part being formed with a vertical parallel sided second groove open at the top to receive the lower edge of the vertical wall section and perpendicular to and above said first groove,

(d) means for retaining and sealing said wall sections in their mounted position in said junction member, said retaining and sealing means comprising a first resiliently deformable sealing strip under compression yet movable in said first groove adjacent to the inserted part of the bottom section and a second resiliently deformable sealing strip under compression in the second groove adjacent to the inserted part of the vertical wall section, whereby any upward deformation of said bottom section due to external hydrostatic pressure can be accommodated by withdrawal of at least part of said bottom section from said juncture member so as not to cause damage to said pool sections, and

(e) a finishing strip of resiliently deformable plastic material shaped for engagement with the upper inside part of said juncture member and covering the same, said finishing strip bearing against said vertical wall section above said junction member and said strip bottom wall section inwardly of said junction member

4,370,840

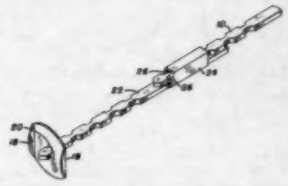
INSULATION ANCHOR

Charles B. Bisbee, Newton Square, Pa., and Richard J. Yost, Medford Lakes, N.J., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 86,981, Oct. 22, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 188,802

Int. Cl.³ E04B *1/62;* **F16B** *21/04*

U.S. Cl. 52—410 **2 Claims**



1. A high temperature insulating construction wherein a first metallic stud is attached at one end thereof to a structural supporting member and is disposed essentially perpendicular to the surface of the structural supporting member, said first metallic stud having at least two anchor-engaging notches spaced along the length thereof, the improvement comprising:

a. a second metallic stud having at least one anchor-engaging notch, a portion of said second metallic stud overlapping a portion of said first metallic stud and the remaining portion of said second metallic stud extending outwardly from the end of said first metallic stud essentially perpendicular to and away from said structural supporting surface,

b. means attached to said second metallic stud comprising:

i. a tube portion slidably encircling at least a portion of said overlapping portion of said first metallic stud whereby said second metallic stud and said attached tube portion may be slidably located in a desired position along the length of said first metallic stud,

ii. a notch-engaging portion including a tab, said tab being bent into engagement with one of said anchor-engaging notches on said first metallic stud to retain said second metallic stud in a selected position with respect to said first metallic stud; and

c. anchor means positioned on said second metallic stud and engaging an anchored-engaging notch thereon whereby a body of insulating material greater in thickness than the length of said first metallic stud is superimposed over the structural supporting member and is pierced by said first and second metallic studs and retained thereon by said anchor means on said second metallic stud.

4,370,841

CONNECTOR ASSEMBLY

Moriyoshi Hayashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Jul. 14, 1980, Ser. No. 168,046

Claims priority, application Japan, Jul. 26, 1979, 54-103461[U]

Int. Cl.³ E04C *1/34*

U.S. Cl. 52—464 **4 Claims**

1. A connector assembly for connecting two adjacent panels edge to edge and to a building frame with a joint opening between such adjacent panel edges, each of the panels having a groove extending longitudinally along the edge thereof, the building frame having a portion disposed adjacent to one face of the joint opening, said connector assembly comprising:

(a) at least a pair of first members each including

(1) a base having a single first portion adapted to be held in the groove of a respective one only of the panels and a second portion adapted to be secured to the portion of the building frame, said first portion of the base of one

of said first members of a pair being received in said groove in one only of said adjacent panels and said first portion of the base of the other of said first members of a pair being received in said groove in the other of said adjacent panels only, and

(2) retainer means formed on said second portion of said base integrally therewith and adapted to be disposed adjacent to the other face of the joint opening; and

(b) a second member for covering the joint opening on the other face thereof, said second member having at least one leg extending into said retainer means on said second portion of the base of both of said first members of a pair and being retained thereby.

4,370,842

REPAIR PATCHING KIT FOR PANELS

Verble C. Martin, and Robert J. Forestal, both of Indianapolis, Ind., assignors to Vern R. Young, Indianapolis and Peter G. Fruehman, Noblesville, both of, Ind., a part interest to each

Filed Sep. 15, 1980, Ser. No. 186,856
Int. Cl.³ E04G *23/02*
U.S. Cl. 52—514 **3 Claims**

1. A repair patching kit for applying a repair patch to a panel having a hole therein and having restricted access to the interior face to the panel, comprising:

a first body member;

a second body member;

a third body member;

adhesive holding means for operatively holding the second body member operatively against the interior face of the panel in the region of but straddling the hole in the panel, the adhesive holding being adhesive means having a drying or curative time;

and second holding means for operatively holding the first body member in the region of the hole in the panel and connected to the second body member but exteriorly of the second body member and with the exterior face of the first body member operatively flush with or inwardly of the exterior face of the panel;

the said second body member being of a form, in relation to the size of the panel hole, which provides that in an installation step the second member may be passed through the panel hole from exteriorly of the panel to a position interiorly of the panel, but nevertheless is long enough, when moved to a position in which it straddles the panel hole, to provide its function of providing retaining support for the first body member by retaining engagement with the interior face of the panel adjacent the hole;

and means operatively interconnecting the second and the third body members, the third body member being positioned exteriorly of the panel so as to be able to operatively bear inwardly, against the panel outwardly of hole and exteriorly of the panel thus supporting the second body member against the panel throughout the said drying or curative time, the last-mentioned interconnecting means being of easily released nature or form for freeing the third body member from its position bearing against the exterior surface of the panel when the said drying or curative time has passed;

in which the third body member is long enough to operatively straddle the panel hole to present portions of the third body member to provide its temporary support of the second body member, during the drying or curative time of the adhesive means, by operatively bearing inwardly against the panel adjacent the hole therein;

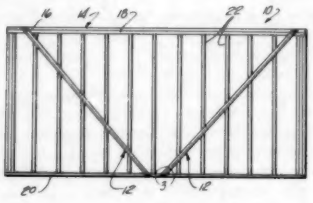
and in the thus-assembled position, the first body member provides a portion of the exteriorly-facing panel repair or a body member to which patching mastic may adhere to in a spread thereof from the exterior surface of the panel outwardly adjacent the hole therein.

4,370,843

WALL SUPPORT BRACE

Richard J. Menge, 33 S. Plaza, Rochester, Mich. 48063

Filed Aug. 21, 1980, Ser. No. 180,123
Int. Cl.³ E04C *3/292*
U.S. Cl. 52—693 **19 Claims**



1. A wooden structure of a building construction comprising:

at least one elongated top plate and at least one elongated bottom plate;

a plurality of spaced wooden truss elements secured to said top and bottom plates;

a narrow, transversely inclined channel in each truss element, and said channels are aligned in a manner to receive a straight metal strip inserted therein;

said metal support strip comprising a base portion generally U-shaped in cross section wherein the opposing sides of said base portion extend generally along a first axis, said U-shaped portion being positioned in said channels, and further comprising two flanges extending outwardly from said U-shaped portion and aligned generally along a second axis normal to said first axis wherein the strip is dimensioned in accordance with the relationship: I_y is less than I_x, wherein I_y is the moment of inertia about said first axis and I_y is the moment of inertia about said second axis; and

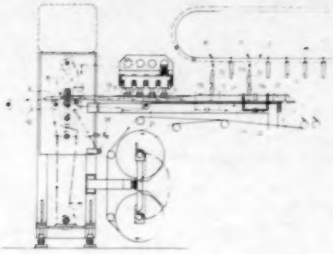
first means for fixedly securing said strip to the wooden structure.

4,370,844

PACKAGING APPARATUS

Kaj Degn, Hasselager, and Ejvind Waldstrom, Hundslund, both of Denmark, assignors to O. G. Hoyer A/S, Hojbjerg, Denmark

Filed Sep. 12, 1980, Ser. No. 186,468
Int. Cl.³ B65B *9/06*
U.S. Cl. 53—546 **6 Claims**



1. In an apparatus for wrapping objects in bags, the combination of a feeding conveyor including gripping means for holding and conveying said objects in successive rows each extending transversely of the conveying direction, driving means for advancing lines of wrapping material in substantially parallel spaced relation to each other and in said conveying direction below said conveyor, said gripping means being releasable to deposit the objects upon said lines, means adjacent said lines for folding each line around the objects thereon and sealing the folded line longitudinally into a tube, means for sealing the tube crosswise between successive objects on the line and for cutting the line at each said crosswise sealing, the number of said lines which can be advanced by said driving means being one-half the number of gripping means in each said row, longitudinally spaced first and second stations where objects are deposited upon said lines from the feeding conveyor, means for releasing every second gripping means in a said row at said first depositing station, means for releasing the remaining gripping means in said last-mentioned row at said second depositing station, and means located at at least one of said depositing stations for displacing a row of gripping means transversely of said lines in preparation for depositing of objects, said displacing means being operable to cause each said line to receive from each row a pair of objects which were adjacent each other when approaching said first station.

4,370,845

METHODS OF AND APPARATUS FOR CLOSING BAG MOUTHS

Roland F. Perolls, The Entrance Lodge, Sandy Warren, Sandy, Bedfordshire, and Norman R. Steel, 56 Norton Rd., Letchworth, Hertfordshire, both of England

Filed Aug. 14, 1980, Ser. No. 177,939
Claims priority, application United Kingdom, Aug. 15, 1979, 7928361
Int. Cl.³ B65B *1/06, 43/30, 7/06, 51/14*
U.S. Cl. 53—572 **11 Claims**

1. A bag filling and closure apparatus, comprising

a filing station including means for opening a mouth of a bag in said filling station;

a supply chute including

means for raising and lowering said chute into and out of the mouth of the bag to be filled,

means for clamping the bag mouth to the chute, and means for moving said chute to and from said filing station; and

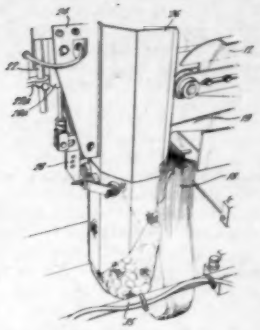
a bag sealing station including

a pair of mouth tensioning elements,

first means for moving said elements into and out of the bag mouth supported by said chute,

second means for moving said elements apart to support the bag mouth as said means for clamping the bag mouth are released and as said chute is withdrawn from the bag mouth and returned to said filling station,

elongated heat sealing means for engaging and sealing sides of the bag mouth together, and



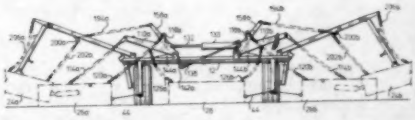
control means for controlling said heat sealing means and said tensioning elements such that said elongated heat sealing means engage and clamp portions of the bag mouth sides lying between said tensioning elements together for partial welding while said tensioning elements are in the bag mouth.

4,370,846

GANG MOWER WITH SINGLE CYLINDER LIFTING MECHANISM

William T. Arnold, Sutton West, Canada, assignor to Brouwer Turf Equipment Limited, Keswick, Canada

Filed Jun. 18, 1981, Ser. No. 274,905
Claims priority, application Canada, Oct. 17, 1980, 362692
Int. Cl.³ A01D *75/30*
U.S. Cl. 56—6 **20 Claims**



1. A gang mower having:

(1) a frame adapted for movement along a path of travel,

(2) a pair of mowers, one on each side of said frame,

(3) means mounting each mower to said frame for up and down movement of said mower so that said mower may follow the contour of the ground over which it travels,

(4) first actuating means mounted on said frame adjacent one side thereof and associated with said mower on said one side and second actuating means on said frame adjacent to the other side thereof and associated with said mower on said other side,

(5) each actuating means including lifting arm means rotatable from a lowered to a raised position,

(6) connecting means connected between each lifting arm means and its associated mower and dimensioned to raise such mower from a lowered operating position to a raised position when such lifting arm means is rotated from its lowered to a raised position and for permitting said up and down movement of such mower when such mower is in said lowered position,

(7) equalizer link means connected between said actuating means for rotation of one lifting arm means in one direction from one of said raised and lowered positions to the other of such positions to cause equal rotation of the other lifting arm means in the opposite direction of rotation from said one of said raised and lowered positions to the other of such positions,

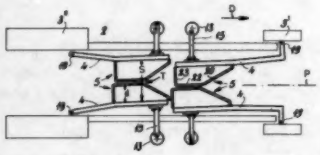
(8) and means including a piston and cylinder connected to at least one of said first and second actuating means and operable to rotate said one lifting arm means between said raised and lowered positions and thereby to effect rotation of the other lifting arm means in the opposite direction of rotation between said raised and lowered positions, thus to raise and lower said mowers.

4,370,847

GRAPE HARVESTER

Claude B. Arnaud, Theize, France, assignor to Societe Anonyme Dite: Corneloup S.A., Lozanne, France

Filed Oct. 9, 1981, Ser. No. 310,342
Claims priority, application France, Oct. 10, 1980, 80 22094
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—330 **10 Claims**



1. A grape-harvesting apparatus comprising:

a portal-type chassis adapted to travel along the ground in a predetermined direction;

two vertical supports on said chassis elongated in said direction and at least limitedly horizontally movable on said chassis, said supports normally flanking an upright median plane extending in said direction;

respective pluralities of vertically spaced and horizontally extending beater wires on said supports, each wire having relative to said direction

a front wire end attached to the respective support,

a forward wire portion inclined inwardly and backwardly toward said plane,

a rear wire portion generally parallel to said plane, and

a rear wire end attached to the respective support behind the respective front end;

drive means on said chassis for synchronously and oppositely displacing said supports with the respective beater wires transverse to said direction while maintaining said supports generally parallel, whereby grapes will be shaken from grape vines between said beater wires.

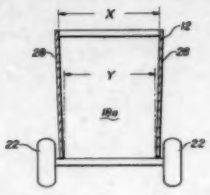
4,370,848

BALING MACHINE WITH TAPERED BALE CHAMBER

Willis R. Campbell, Ephrata; John H. Freimuth, New Holland; Anthony F. Diederich, Jr., Terre Hill, and Richard E. Jennings, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 24, 1981, Ser. No. 305,063
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **13 Claims**

1. In a roll baling machine for forming cylindrical roll bales of crop material having a base frame and a bale chamber, wherein the improvement comprises at least a portion of said bale chamber being substantially tapered in width generally from its top to its bottom so that the friction between the end surfaces of a cylindrical roll bale and the sides of said bale chamber portion will be less generally toward the top of said bale chamber than toward the bottom thereof to facilitate



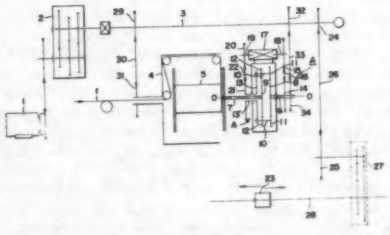
discharge of a roll bale from the machine and whereby the weight of the roll bale aids in discharging it from the machine.

4,370,849

STRANDING DEVICE OF A STRANDING MACHINE

Kanji Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Kinrei Kikai Seisakusho, Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,261
Claims priority, application Japan, Sep. 12, 1979, 54-116144
Int. Cl.³ D07B *3/08, 7/10;* B65H *54/02*
U.S. Cl. 57—71 **3 Claims**



1. A stranding machine for winding a plurality of wires on a winding drum, comprising:

a driving shaft;

a flier for said winding drum;

a first and a second sun gear, said first sun gear mounted on a first shaft driven by said drive shaft, said second sun gear mounted coaxially with first sun gear on a second shaft fixed to said winding drum;

at least one set of first and second planet gears each said at least one set being coaxially mounted on a third shaft and respectively meshing with said first and second sun gears;

a rotating disk rotatably mounted on said second shaft coaxially with said sun gears, each said third shaft being mounted on said rotating disk;

stepless variable ratio transmission means; and

means for transmitting rotational motion from said first shaft to said transmission means and from said transmission means to said rotating disk;

whereby the rotating speed ratio of said winding drum can be changed by varying said transmission means.

4,370,850

ROVING FRAME AND A METHOD OF PACKAGING ROVING

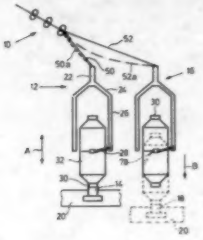
Emil Briner, and Peter Novak, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sep. 26, 1980, Ser. No. 191,302

Claims priority, application United Kingdom, Sep. 28, 1979, 7933785

Int. Cl.³ D01H 7/50

U.S. Cl. 57—96 24 Claims



1. A roving frame comprising:
a drafting mechanism for delivering at least one roving;
a spindle for mounting a bobbin thereon;
a rotatable flyer for receiving the roving from said drafting mechanism and for winding the roving onto a bobbin on said spindle to form a roving package; and
a controllable tension adjusting means for reducing tension in a continuous length of roving which extends between said drafting mechanism and the package during stoppage of said drafting mechanism and the package at an intermediate stage of a winding operation.

4,370,851

YARN FALSE TWISTING APPARATUS HAVING ADJUSTABLE FRICTION DISCS

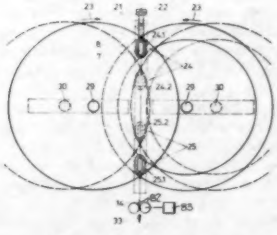
Detley Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,077

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Jul. 9, 1980, 3025921

Int. Cl.³ D02G 1/08

U.S. Cl. 57—340 23 Claims



1. A yarn false twisting apparatus comprising
a frame,
a pair of twist imparting circular discs, with each disc including a yarn engaging friction surface, and with at least one of said discs being relatively thin and flexible,
means mounting said discs to said frame, with said discs being rotatable about generally parallel spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship and define a twisting zone therebetween, and including means permitting selective relative movement of said discs along a direction generally perpendicular to their axes of rotation and parallel to the plane defined by such axes of rotation,
a pressure applying member,
means mounting said pressure applying member to said frame for selective movement along a path of travel which extends perpendicular to said plane defined by the axes of rotation of said discs, and so as to locally bias said one flexible disc toward the other disc only at said twisting zone,
drive means for rotating each of said discs about their respective axes, and such that a yarn may be continuously advanced through said twisting zone while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces resulting from the force exerted by the biasing means,
whereby the ratio of twist to yarn speed may be selectively varied by selective movement of said discs with respect to said pressure applying member.

4,370,852

FRICTION FALSE TWISTING APPARATUS

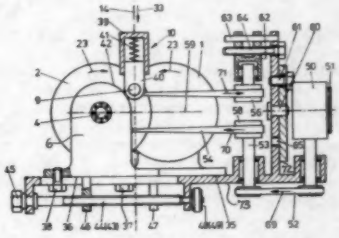
Detley Oberstrass, Tönisheide; Wolfgang Hartig, and Klaus Weber, both of Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,079

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3025884

Int. Cl.³ D02G 1/08

U.S. Cl. 57—340 5 Claims



1. A yarn false twisting apparatus comprising
a central frame,
drive means including a drive belt operatively mounted to said central frame for movement along an endless path of travel,
a support bracket,
a pair of twist imparting members rotatably mounted to said support bracket, with each of said members including a yarn engaging friction surface, and such that portions of the respective yarn engaging friction surfaces are disposed in opposing face to face relationship and define a twisting zone therebetween,
a drive whorl rotatably mounted to said support bracket and so as to tangentially contact said drive belt,
means drivingly interconnecting said drive whorl and said twist imparting members, such that a yarn may be continuously advanced through said twisting zone while having twist imparted thereto by the opposed friction surfaces of said twist imparting members, and
means mounting said support bracket to said central frame for pivotal movement through 180 degrees about an axis which is perpendicular to the axis of said whorl and extends through the medial portion of said whorl, to thereby permit selective operation in a first position wherein S

twist is imparted to the yarn and a second position disposed 180 degrees from the first position wherein Z twist is imparted to the yarn.

4,370,853

FRICTION FALSE TWISTING APPARATUS

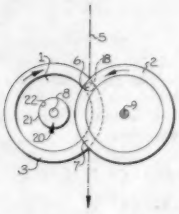
Karl Bauer; Heinz Schippers, and Peter Dammann, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 272,936, Jun. 12, 1981, which is a continuation-in-part of Ser. No. 168,734, Jul. 14, 1980, Pat. No. 4,339,915. This application Sep. 28, 1981, Ser. No. 306,163

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928522; Jun. 26, 1980, 3023887; Jun. 15, 1981, 3123753; Japan, Jun. 26, 1981, 56-98481; Switzerland, Jun. 11, 1981, 3827/81; Jun. 11, 1981, 3830/81; United Kingdom, Jun. 26, 1981, 8119754

Int. Cl.³ D02G *1/08*

U.S. Cl. 57—340 **4 Claims**



1. A yarn false twisting apparatus comprising

a pair of twist imparting members, with each member including a yarn engaging friction surface, and at least one of said members comprising a circular disc,

means rotatably mounting said twist imparting members such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship and define a twisting zone therebetween, said mounting means for said circular disc including a supporting shaft and an elastomeric body member interposed between said circular disc and said shaft so as to permit said disc to resiliently incline with respect to the axis of said shaft,

drive means for operatively rotating each of said twist imparting members about their respective axes, and

means for resiliently biasing said circular disc toward the other member only at said twisting zone,

whereby a yarn may be continuously moved through said twisting zone while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

4,370,854

FUEL VALVE

Raymond L. Williams, Evendale, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

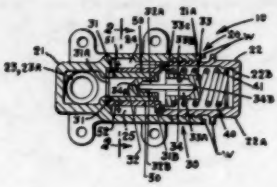
Filed Sep. 16, 1980, Ser. No. 187,646

Int. Cl.³ F02K *3/10*

U.S. Cl. 60—261 **16 Claims**

1. A liquid fuel valve assembly, comprising:

a. a housing made of high temperature resistant material and having a first constituent portion with a bottom surface, a second constituent portion releasably connected to said first constituent portion, a fuel inlet duct in said first constituent portion with said duct having an inlet, a first liquid fuel discharge duct in said first constituent portion with this duct having a first discharge duct outlet, and a second liquid fuel discharge duct in said first constituent portion with this duct having a second discharge duct outlet, with said first and second discharge duct outlets being located in said bottom surface of said first constituent portion, wherein said first and second discharge ducts of said housing comprise spiral-like voids in said first constituent portion of said housing, with said voids having respective origins on a common axis, and with said voids having



separated respective terminuses which constitute said outlets of said discharge ducts; and

b. a liquid fuel valve subassembly means for selectively controlling a flow of liquid fuel, in said housing, between said inlet of said housing and said first and second discharge duct outlets in said housing.

4,370,855

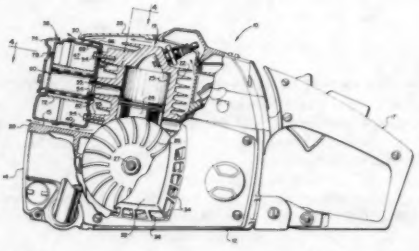
MUFFLER FOR PORTABLE ENGINE

Lloyd H. Tuggle, Shreveport, La., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 51,950, Jun. 25, 1979, Pat. No. 4,286,675. This application Sep. 8, 1980, Ser. No. 185,251

Int. Cl.³ F01N *3/02, 1/08;* B27B *17/00*

U.S. Cl. 60—317 **20 Claims**



1. A muffler for an internal combustion engine driven hand held power tool, said tool including an engine having a cylinder and an exhaust port in said cylinder, and a cooling air fan, said muffler being adapted to be mounted in a cooling air flowstream provided by said fan, said muffler being characterized by:

a hollow shell having spaced apart endwalls and a peripheral sidewall contiguous with said endwalls to form an expansion chamber;

an opening in one of said endwalls forming a muffler inlet port arranged to be in communication with said exhaust port;

means forming an exhaust gas outlet opening in said shell; and

an exhaust gas deflector disposed on said muffler in relation to said outlet opening in said shell and cooperable with said sidewall of said shell to form a flow passage for exhaust gas exiting said shell whereby the direction of flow of exhaust gas is generally in the same direction as the exhaust gas flow into said muffler from said exhaust port, said deflector including a wall portion spaced from said sidewall of said shell to direct the flow of exhaust gas over at least a portion of said shell and in the same direction as

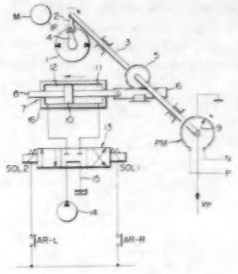
said cooling air for mixing with said cooling air to cool said exhaust gases and said shell.

4,370,856

CONTROL METHOD FOR WINCH OF MINING MACHINERY

Keishi Ito, and Ryuji Yamada, both of Oomuta, Japan, assignors to Kabushiki Kaisha Mitsui Miike Seisakusho, Tokyo, Japan

Filed Aug. 12, 1980, Ser. No. 177,400
Claims priority, application Japan, Aug. 24, 1979, 54-107075
Int. Cl.³ F15B 7/00
U.S. Cl. 60—389 **2 Claims**



1. An electro-mechanical arrangement for driving a winch, comprising in combination:

(a) actuating means (1) and a motor (M) for driving the actuating means (1);

(b) a lever (4) coupled to the actuating means (1) for adjusting the actuating rate of said actuating means, a central shaft (3) with a pinion (5) thereon coupled to the lever (4);

(c) a rack (6) operatively connected to the pinion (5), a piston rod (8) connected to the rack (6), with a piston (10) in a fluid pressure cylinder (7) defining first and second chambers (11, 12);

(d) fluid pump means (14, 15) connected to said first and second chambers (11, 12) and first and second electric solenoid means for controlling the fluid flow to said first and second chambers (11, 12) to move said rack (6) and turn said pinion (5), first and second switch means to enable said first and second solenoid means, electrical resistance position means (9) coupled to said central shaft (3) giving the position of said shaft as an electrical value;

(e) instruction means (17, 18), for positioning the winch, a pulse generator (19) responsive to said instruction means supplying pulses, counter means (21) counting the pulses, converter means (22), changing said pulses into an electric value, and comparison means (23) coupled to said converter means (22) and to said electrical resistance position means (9); and,

(f) an operating circuit (24) coupled to said comparison means (23) driving said first and second switch means.

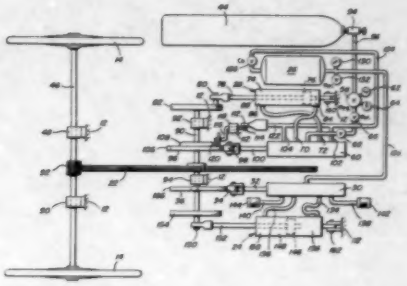
4,370,857

PNEUMATIC SYSTEM FOR COMPRESSED AIR DRIVEN VEHICLE

Terry R. Miller, Box 80, Crestline, Kans. 66728

Filed Jul. 11, 1980, Ser. No. 167,524
Int. Cl.³ F60D 31/02
U.S. Cl. 60—413 **5 Claims**

4. In a fluid power operated motor system, including at least one pair of double-acting piston devices respectively having piston elements and a storage source of pressurized fluid, the improvement comprising, pressure accumulating means operatively connected between said piston devices for transfer of fluid exhausted from one of the piston devices to the other of the piston devices, valve means connected to said piston devices for pressurization of said one of the piston devices and limiting said transfer of fluid exhausted therefrom to spaced intervals of time during which the storage source and the pressure accumulating means are substantially equalized in



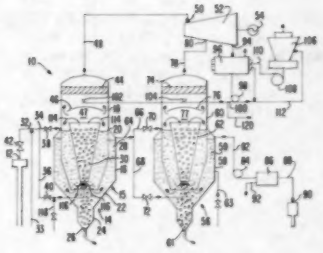
pressure, and vent means for venting the fluid exhausted from said one of the piston devices between said spaced intervals of time.

4,370,858

APPARATUS AND METHOD FOR ENERGY PRODUCTION AND MINERAL RECOVERY FROM GEOTHERMAL AND GEOPRESSURED FLUIDS

Leon Awerbuch, San Francisco, and Alfred N. Rogers, Pleasanton, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Jul. 31, 1981, Ser. No. 288,713
Int. Cl.³ F03G 7/00
U.S. Cl. 60—641.5 **77 Claims**



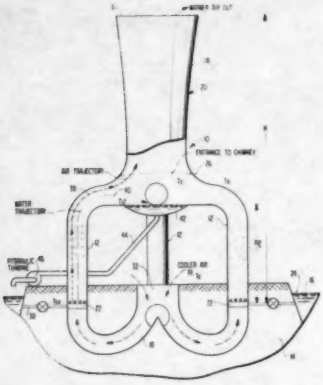
1. A system for processing fluid from a subterranean location with the fluid having an elevated temperature and pressure, having dissolved and suspended solids therein, and capable of being separated into solid, liquid and vapor fractions comprising: a reactor for receiving a flow of the fluid from a subterranean location; means in the reactor for permitting the fluid received thereby to flash to form the vapor fraction and to provide intimate contact of the solid, liquid and vapor fractions of the fluid in a 3-phase fluidization relationship; means coupled with the reactor for directing the vapor fraction out of the reactor; means in the reactor for causing at least a portion of the liquid fraction of the fluid to separate from the solid fraction thereof; means coupled with the reactor for allowing removal of the solid fraction from the reactor; and means coupled with the reactor for directing the separated liquid fraction out of the reactor.

4,370,859

METHOD OF AND MEANS FOR LIFTING WATER AND GENERATING POWER THEREFROM

Gad Assaf, Rehovot, Israel, assignor to Lucien Y. Bronicki, Yavne, Israel, a part interest

Filed Nov. 26, 1979, Ser. No. 97,439
Int. Cl.[3] F03G 7/04
U.S. Cl. 60—641.6 16 Claims



1. A method of lifting water for generating power comprising the steps of:

(a) spraying droplets of relatively warmer water into relatively cooler air for creating an upwardly flowing air mass due solely to a transfer of heat from the water to the air and creating an air/water-droplet environment in which drag forces acting on the droplets raise the droplets from a lower level to an upper level; and

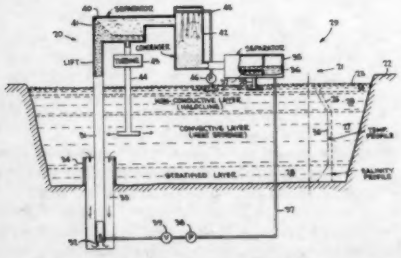
(b) collecting the droplets at the upper level.

4,370,860

METHOD OF AND MEANS FOR GENERATING POWER FROM A HOT BRINE SOURCE

Gad Assaf, Rehovot, Israel, assignor to Solmat, Yavne, Israel

Filed Jun. 3, 1980, Ser. No. 155,971
Int. Cl.[3] F03G 7/02
U.S. Cl. 60—641.11 44 Claims



1. A method for generating power from a body of hot liquid working fluid using a direct contact heat exchanger comprising steps of:

(a) injecting liquid operating fluid into the working fluid at a depth which is more than about one-third of the depth at which the pressure of the working fluid is approximately equal to the vapor pressure of the operating fluid at the temperature of the working fluid for producing a bubble regime in a vertically oriented lift tube whose lower end is disposed in the working fluid whereby working fluid in the lift tube is raised as the bubbles rise;

(b) separating the gaseous operating fluid from the liquid working fluid at the top of the lift tube, and returning the latter to the body of hot liquid working fluid;

(c) condensing the gaseous operating fluid and returning it for injection into the working fluid at the lower end of the lift tube; and

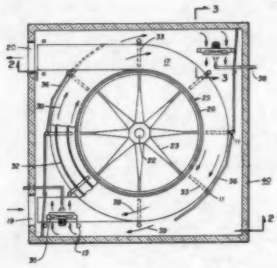
(d) passing working fluid lifted in the lift tube through an hydraulic turbine for generating power.

4,370,861

SPIRAL-TYPE HEAT EXCHANGER

Norris G. Lovette, Jr., Breinigsville, and David R. Ruprecht, Laurys Station, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 199,130, Oct. 22, 1980, Pat. No. 4,324,110.
This application Dec. 21, 1981, Ser. No. 333,224
Int. Cl.[3] F25D 13/06
U.S. Cl. 62—63 3 Claims



1. The method of refrigerating food articles by heat exchange during their travel through a vertical helical path within an insulated enclosure housing, which method comprises contacting said articles with a recirculating heat exchange fluid flowing along said helical path and coincident with said helical path for a substantial distance thereon, inducing flow of said heat exchange fluid through propulsion by substantially diametrically spaced axial flow fans, positively confining flow of said heat exchange fluid within said helical path for at least a substantial portion of the outer periphery of said helical path, and discharging Refrigerant into said circulating heat exchange fluid substantially at the locus of fan propulsion and in a direction counter to such propulsion.

4,370,862

APPARATUS AND METHOD FOR FREEZING A SLUG OF LIQUID IN A SECTION OF A LARGE DIAMETER FLUID TRANSMISSION LINE

Beryle D. Brister, Amarillo, Tex., assignor to Brister Incorporated, Amarillo, Tex.

Division of Ser. No. 722,665, Sep. 13, 1976, Pat. No. 4,112,706.
This application Sep. 6, 1977, Ser. No. 831,052
Int. Cl.[3] F25C 1/00
U.S. Cl. 62—66 10 Claims

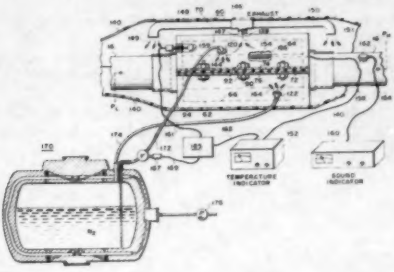
1. A method of freezing a slug of liquid in a section of fluid transmission line by the transfer of thermal energy from the slug of liquid through the transmission line to a pool of liquid cooling fluid which evaporates when exposed to a predetermined range of pressure and temperature conditions comprising:

enclosing the section of transmission line with thermally insulated material to define an insulated chamber around the section;

discharging liquid cooling fluid into the chamber until the chamber is at least partially filled by the liquid and at least a portion of the enclosed transmission line is submerged in

a pool of the liquid cooling fluid, said step being terminated thereafter during a predetermined interval while the liquid cooling fluid evaporates in response to the transfer of heat from the transmission line, said step being repeated thereafter to replenish the evaporated cooling fluid;

sensing the temperature of the surface of the enclosed transmission line as the chamber is filled;



said step of discharging liquid cooling fluid into the chamber being repeated to replenish the evaporated cooling fluid in response to an increase in temperature of the transmission line to a predetermined level as indicated by the temperature sensing step;

agitating the liquid in the pool;

exhausting cooling fluid vapor from the chamber; and

sensing the rate of formation of crystals within the slug of liquid as it freezes.

4,370,863

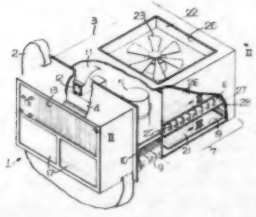
AIR CONDITIONER

J. D. Fisher, St. Louis, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Mar. 12, 1981, Ser. No. 243,071

Int. Cl.³ F25D *17/06*

U.S. Cl. 62—89 **3 Claims**



1. A method for providing condenser cooling air to an air conditioner having a solids settling chamber in substantially straight flow-through communication with an air cooled condenser aligned above the settling chamber during operation of the air conditioner in a windy and dusty environment comprising:

drawing an air stream of ambient air vertically upward into a confined, uniformly sized settling chamber in a direction substantially perpendicular to the direction of the natural wind flow in a straight laminar path for a preselected distance at a velocity in the range of 350 feet to 500 feet per minute sufficient to permit settlement of particulate dust matter entrained in said air stream; and

circulating the air stream through the condenser and out of the air conditioner in substantially the same vertical, laminar path as the flow of air passing through the settling chamber.

4,370,864

METHOD AND APPARATUS FOR COOLING HEATED GASES OR LIQUIDS

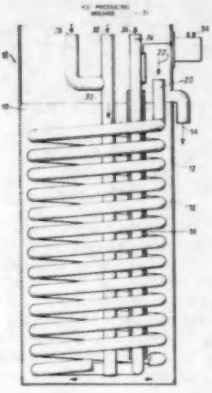
Theo Wessa, Siedlung 19, 6751 Mackenbach, Pfalz, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,838

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014179

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—98 **13 Claims**



8. The combination comprising:

(A) a cooling machine which produces residual water, said cooling machine utilizing a fluid coolant;

(B) apparatus for cooling said fluid coolant, said apparatus comprising:

(1) an open topped container;

(2) means for supplying cooling water to said container at a location near the bottom thereof;

(3) an overflow outlet located near the open top of said container for permitting overflow water to exit from said container;

(4) a cooling pipe located in said container and extending substantially from the bottom of said container to said overflow outlet;

(5) means for circulating said coolant under pressure through said cooling pipe, said circulating means causing said coolant to flow through said cooling pipe in such a manner that it first comes into thermal contact with said cooling water near the top of said container and thereafter continues down said cooling pipe toward the bottom of said container whereby said coolant comes into thermal contact with increasingly cooler water as it moves down said pipe;

(C) means for introducing said residual water into said container as a part of said cooling water.

4,370,865

ICE-MAKING AND FRESH WATER DISPENSING APPARATUS

Takashi Hibino, and Yoshinori Ito, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

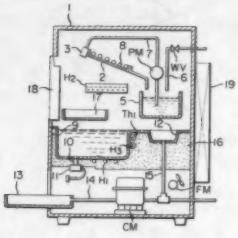
Filed Aug. 31, 1981, Ser. No. 297,972

Int. Cl.³ F25B *25/00*

U.S. Cl. 62—124 **6 Claims**

1. An ice-making and fresh water dispensing apparatus, comprising in combination: an ice-making unit for making pure

ice using a refrigeration system; means for heating the ice issued from said ice-making unit to melt the same into fresh water; a tank for storing the fresh water produced by said melting means; means for sensing the temperature of the fresh water in said tank; means for sensing the water level in said tank; and means for controlling the operations of said heating means and said ice-making unit, said controlling means being operative to terminate heating by said heating means and to continue the operation of said ice-making unit, irrespective of the water level prevailing in the tank, when said water temperature sensing means has determined the water temperature in



said tank to be higher than a predetermined temperature, to continue both the heating by said heating means and the operation of said ice-making unit when said water temperature sensing means has determined said water temperature to be lower than said predetermined temperature and the water level in said tank is lower than the predetermined water level, and to discontinue the heating by said heating means and continue the operation of said ice-making unit when said water temperature sensing means has determined said water temperature to be lower than said predetermined temperature and said water level is higher than the predetermined water level.

4,370,866

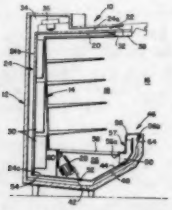
REMOVABLE DUCT PANEL FOR MULTIBAND REFRIGERATED DISPLAY CASES

Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation of Ser. No. 76,568, Sep. 18, 1979, abandoned. This application Dec. 30, 1980, Ser. No. 221,375

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—256 **6 Claims**



1. A refrigerated display case comprising:

an outer cabinet having a bottom portion which slopes downwardly to form a drain region for collecting fluid material by gravity flow;

an inner cabinet within said outer cbinet and spaced therefrom, said inner cabinet having a product display space therein, said inner and outer cabinets having aligned access openings to permit access to the display space in the inner cabinet;

means intermediate said inner and outer cabinets for dividing the space between said cabinets into adjacent first and second conduits, each conduit having respective outlets and inlets on opposite sides of the aligned cabinet access openings, wherein said intermediate means for dividing the space between the inner and outer cabinets comprises a first relatively fixed bottom panel member and a second removable panel member;

air circulating means for propelling air through said first and second conduits between their respective inlets and outlets and across the aligned access openings between the respective conduit outlets and inlets;

means for refrigerating the air flowing through at least one of the first and second conduits;

means at one end region of the first bottom panel member for loosely receiving therein one end portion of the second panel member;

support means located on the underside of the second panel member for supporting said second panel member on the bottom portion of the outer cabinet in spaced relation thereto;

inlet grill means;

grill support means for loosely supporting said inlet grill means in a position to cover the first and second conduit inlets; and

a removable bottom shelf defining the bottom of the inner cabinet and display space;

said inlet grill means including means for loosely supporting at least a portion of the removable bottom shelf.

4,370,867

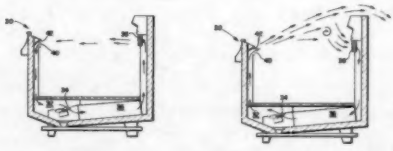
OPEN TOP REFRIGERATED DISPLAY CASE WITH AMBIENT AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 145,859, May 1, 1980, Pat. No. 4,314,457, and a continuation-in-part of Ser. No. 76,669, Sep. 18, 1979, Pat. No. 4,314,453, and a continuation-in-part of Ser. No. 60,459, Jul. 25, 1979, abandoned, and a continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned, and a continuation-in-part of Ser. No. 225,997, Jan. 19, 1981, Pat. No. 4,338,792. This application Mar. 18, 1981, Ser. No. 244,959

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—256 **16 Claims**



9. An open top refrigerated display case being selectively operated in a refrigeration cycle and adefrost cycle, said display case comprising: a bottom wall and four side walls; an air conduit extending along a first of said side walls, along said bottom wall and a second of said side walls, said first and second side walls being opposing side walls, said air conduit having first and second openings at its opposite ends and each of said openings being located near the top portion of the respective said side wall; means for refrigerating air moving through said air conduit during the refrigeration cycle, said means for refrigerating being arranged within said air conduit; air circulating means circulating air within said air conduit in a forward direction during a refrigeration cycle of operation and circulating air in a reverse direction during a defrost cycle of operation, said air circulating means drawing in ambient air from outside of said display case through said first opening when said air circulating means circulates air within said air conduit in a reverse direction; means for switching the operation of said display case between a refrigeration cycle and a defrost cycle; means for directing air leaving said air conduit during a defrost cycle of operation along a path for causing such air to flow over the opposing said side wall of said display

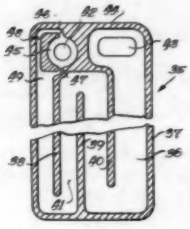
case; and, means for increasing the velocity of emitted defrost air to a sufficient velocity so that such air will flow over such opposing said side wall so that such air substantially avoids reentering said air conduit, and means for increasing the velocity of the air leaving said air conduit during a defrost cycle of operation including means for restricting a portion of the width of said air conduit in an area in the proximity of the second opening of said air conduit.

4,370,868

DISTRIBUTOR FOR PLATE FIN EVAPORATOR

Tong S. Kim, and Yong N. Lee, both of Arlington Heights, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 5, 1981, Ser. No. 222,455
Int. Cl.³ F25B *39/02*
U.S. Cl. 62—504 **14 Claims**



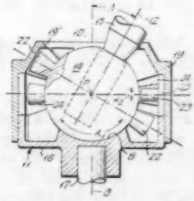
1. An evaporator for an air conditioning system receiving a liquid-vapor mixture of refrigerant from an expansion valve and comprising a plurality of core elements arranged in parallel, each core element formed from a pair of oppositely dished plates joined at the edges and defining an inlet, an outlet and a core cavity connecting the inlet and outlet, the improvement comprising at least one inlet header defined by the inlet openings of the core elements receiving the liquid-vapor refrigerant mixture, an outlet header defined by the outlet openings, a liquid supply orifice from said inlet header to the core cavity of each core element, and a separate vapor supply orifice from said inlet header to the core cavity of each core element to provide an equal distribution of refrigerant liquid and vapor from said header to each of said core elements.

4,370,869

GEAR-TYPE UNIVERSAL COUPLING

Jorgen W. Jonassen, 120 Overlook Ter., Bloomfield, N.J. 07003

Filed Jul. 18, 1979, Ser. No. 58,833
Int. Cl.³ F16D *3/18*
U.S. Cl. 464—156 **10 Claims**



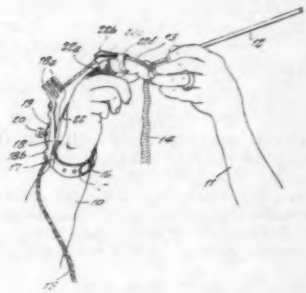
1. A gear-type torque-transmitting universal coupling, comprising rotatable input and output members having coacting formations to retain the same point of intersection of their respective rotary axes while permitting angular flexibility of the relative orientation of said axes about said point of intersection, a first plurality of radially outward tooth formation in the radial plane of said point on one of said members, a second and corresponding plurality of radially inward tooth formations in the radial plane of said point on the other of said members, the teeth of said first and second pluralities being angularly interlaced and all teeth being right-frusto-conical, each tooth being on a radial axis which intersects said point and each tooth being geometrically convergent to said point.

4,370,870

CROCHETING AID

Norma J. Kroh, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 17, 1980, Ser. No. 207,754
Int. Cl.³ D04B *35/00*
U.S. Cl. 66—1 A **3 Claims**



1. A crocheting aid for handicapped people comprising a wristband with a fork mounted thereon, said fork extending forward having spaced tines at a forward end, said fork having a rear end secured transversely to said band in combination with a fabric secured to said band and to an aligned yarn holder at a forward end provided with a finger hole below said holder, said yarn holder, fork and fabric being in longitudinal alignment when mounted in users hand with the band mounted about the users wrist and the users forefinger extending through said hole, said yarn holder including a guide for a strand of yarn and wherein said tines comprise guiding means for said yarn, which extends through the guide and tines, including adjustment means for varying the length of said yarn holder.

4,370,871

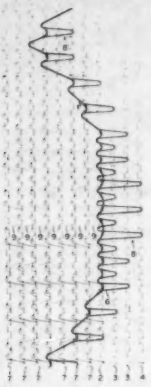
WARP KNITTED NARROW LACE AND PROCESS FOR PREPARATION THEREOF

Noboru Nakagaki, and Hroaki Fujikawa, both of Fukui, Japan, assignors to Takeda Lace Co. Ltd., Fukui, Japan

Filed Nov. 2, 1979, Ser. No. 90,534
Claims priority, application Japan, Nov. 4, 1978, 53-136081
Int. Cl.³ D04B *7/16*
U.S. Cl. 66—202 **1 Claim**

1. A warp knitted narrow lace fabric having a scalloped edge with decorative loops or purls along substantially the entire scalloped edged comprising a Raschel lace base fabric having curved scallops with outermost portions and indented portions formed by knitting a pattern in the base fabric, purls formed by knitting laid in yarns on the outermost portions of said scallops

and purls formed by laying in laid in yarns with stitches of the base fabric in the indentations of the scallops, the stitches of



said base fabric located outwardly of said purls in said indentations being cut and removed.

4,370,872

APPARATUS FOR CONTINUOUSLY TREATING STRAND-LIKE TEXTILE MATERIAL IN VERTICAL LOOPS

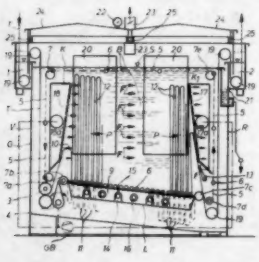
Wolfgang Tschirner, Tönisvorst, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 198,051

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941900

Int. Cl.[3] **D06B** *3/28*

U.S. Cl. 68—158 **5 Claims**



1. An apparatus for continuously treating loops of strand-like textile material, said apparatus comprising:

a container, for treatment liquid, having a bottom and side walls;

transverse bars, having a length greater than the width of said textile strand, for guiding said textile strand through said liquid;

an endless chain connected to said transverse bars and guided in the vicinity of said container bottom and side walls;

an air permeable and liquid permeable stationary support arranged in said container near said bottom thereof for supporting and guiding said transverse bars, said support being inclined relative to the horizontal from the textile strand inlet side to the textile strand outlet side of said container;

upwardly directed nozzles located in said container below said support and arranged to discharge an upwardly directed flow between said transverse bars to aid in formation of the loops of strand-like textile material; and

a device for generating a transverse flow of said treatment liquid in said container so that the transverse flow aids in transporting the loops of strand-like textile material across said container.

4,370,873

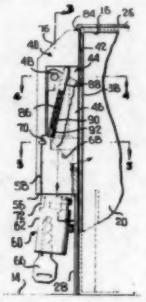
LATCH MECHANISM AND VANDAL RESISTANT HOUSING

Gregory A. Edmunds, 3011 Brinkley Rd., Temple Hills, Md. 20031

Filed Feb. 28, 1980, Ser. No. 125,444

Int. Cl.[3] **E05B** *15/00, 63/00, 65/08;* **G07F** *17/20*

U.S. Cl. 70—163 **5 Claims**



1. A vandal resistant latch mechanism for use in conjunction with coin boxes and the like, said latch mechanism comprising a block of hardened metal having a latching face, a slot opening through said latching face, a latch member, pivot means mounting said latch member for pivoting between an inoperative position within said slot and a latching position projecting from said latching face, said block having an end, a locking receiving opening extending through said end into said slot, and a removable barrel type key actuated lock releasably seated in said opening and forcing said latching member to said latching position, said latch mechanism being part of a protective housing particularly configurated to overlie and protect an ordinarily exposed housing used on a coin actuated mechanism and coin box of the type used in combination with washing machines, dryers and the like, and said protective housing has an opening therein for the passage of coin receiving mechanism.

4,370,874

UNIVERSAL LATCH-LOCK ASSEMBLY

Fred O. Munn, 4510 Town & Country Dr., Charlotte, N.C. 28211

Filed Jul. 27, 1981, Ser. No. 287,160

Int. Cl.[3] **E05B** *5/02, 13/00, 63/04;* **E05C** *3/04*

U.S. Cl. 70—204 **5 Claims**

1. A latch assembly adaptable for use with a panel mounted for either right-hand or left-hand swinging movement in a mating frame and between open and closed positions, said latch assembly being easily convertible to a latch-lock assembly and comprising

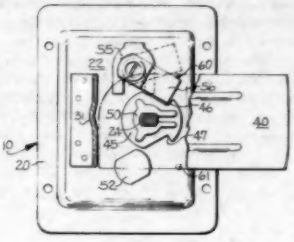
a. a pan-shaped housing including a peripheral rim mounted on and surrounding an opening in said panel, and a depressed central surface positioned in the opening in said panel,

b. a latch-operating stem supported for rotation in said depressed central surface of said pan-shaped housing and including an outer end portion extending through said depressed central surface of said housing, and an inner end

portion extending inwardly from said depressed central surface,

c. an operating handle secured to said outer end portion of said latch-operating stem, said handle being manually operable to rotate said latch-operating stem,

d. a latching pawl including an inner end fixed on a medial portion of said latch-operating stem and a free outer end extending outwardly therefrom, said latching pawl being movable with rotation of said latch-operating stem between a latched position with said free outer end in engagement with said mating frame and an unlatched position with said free outer end out of engagement with said mating frame,



e. a locking collar fixed on said latch-operating stem and adjacent the inside of said depressed central surface, and

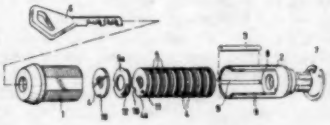
f. a knockout formed in said depressed central surface of said pan-shaped housing and positioned on each side of said latch-operating stem, said knockouts being shaped to selectively receive a key-operated locking cylinder which is engageable with said locking collar to convert the latch assembly to a latch-lock assembly.

4,370,875

SLIPPING CYLINDER LOCK

Paavo Piiroinen, Joensuu, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Feb. 14, 1979, Ser. No. 12,243
Claims priority, application Finland, Feb. 17, 1978, 780542
Int. Cl.³ E05B *63/00*
U.S. Cl. 70—422 **14 Claims**



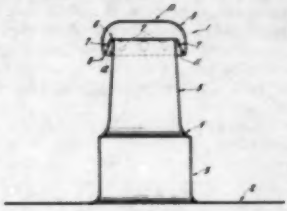
1. A cylinder lock comprising a fixed cylinder housing in which there is a turnable cylinder and locking means for locking said cylinder to said cylinder housing, and wherein turning of said cylinder is performed by means of the key of the lock upon setting said lock mechanism in a cylinder-releasing position by means of said key, said cylinder lock including means for transmitting force from said key to said cylinder, in a first stage of the function of the lock through a clutch device having a slipping function at overload so as to permit those elements of the lock mechanism being enclosed in said cylinder and being directly actuated by said key to slip relative to said cylinder in the turning direction of the key in case said key has not set said lock mechanism in said cylinder-releasing position.

4,370,876

METHODS OF CONSTRUCTING A ONE-PIECE ROOF VENT DEVICE

James W. Ballard, 34934 Elmira, Livonia, Mich. 48150, and Larry R. Ballard, 18633 Negaunee, Redford Township, Wayne County, Mich. 48240

Division of Ser. No. 968,192, Dec. 11, 1978, Pat. No. 4,214,513. This application Jul. 25, 1980, Ser. No. 172,414
Int. Cl.³ B21D *51/16*
U.S. Cl. 72—68 **23 Claims**



1. A method of manufacturing a one-piece ventilation apparatus, comprising the steps of:

forming a substantially hollow projection in a sheet-shaped member,

said substantially hollow projection being substantially perpendicular to said sheet-shaped member; and

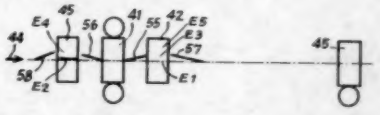
folding an end of said substantially hollow projection longitudinally toward and into overlapping relationship to said one end of said projection to form cap-shaped structure at said end of said projection.

4,370,877

ROLLING MILL ROLLS

Jacques M. Michaux, Joeuf, France, assignor to Sacilor-Aciéries et Laminoirs de Lorraine, Hayange, France

Filed Aug. 11, 1980, Ser. No. 176,678
Claims priority, application France, Feb. 4, 1980, 80 02382
Int. Cl.³ B21B *39/16, 39/18*
U.S. Cl. 72—222 **5 Claims**



3. An improved rolling mill for rolling rails from rail blanks including a finishing stand and at least a universal edger group, each group comprising at least a universal stand having four rolls grooved and set to provide a single universal pass-line irrespective of the number of passes made therein and at least an edger stand having at least two horizontal rolls with the rolls of at least an edger stand being grooved and set to provide a plurality of specific edging grooves, each said groove having a plurality of active deep cavity portions and a bridging non-active shallow portion, said specific edging grooves having parallel but separate edging pass-lines, wherein all stands within any universal edger group are arranged on a straight-away line and are operated in tandem, that is with rail blanks being simultaneously contacted for a period by the rolls of all stands of said universal-edger group and with all driven rolls of said stands being rotated in the same direction, said rolling mill including guides located between each stand of each universal-edger group to direct the rail blank within each universal-edger group from the pass-line of a stand into the pass-line of a downstream stand and including guides located upstream and downstream of each universal-edger group to direct the rail

blanks into and out of respectively the entry and delivery sides of each universal-edger group and of the finishing stand wherein the improved rolling mill comprises:

at least an edger stand, the rolls of which are grooved and set to provide a plurality of specific overlapped edging grooves having in common in an overlapped relationship a part of their bridging non-active shallow portions, with the pass-line of at least one overlapped edging groove being transversely offset with respect to the single universal pass-line of at least a universal stand of the same universal-edger group as said edger stand; and

first means to deviate laterally the rail blanks delivered along the single pass-line of at least a universal stand, towards an offset pass-line of an overlapped edging groove; and

second means to take over and to guide the deviated rail blanks into the offset pass-line of an overlapped edging groove; and

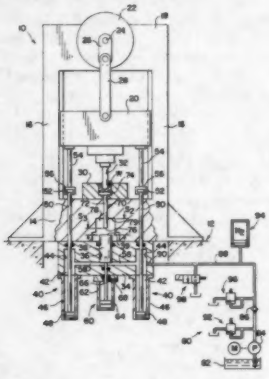
third means to deviate laterally the rail blanks delivered along the offset pass-line of an overlapped edging groove towards the next single pass-line of a next-to-roll stand.

4,370,878

WORKPIECE EJECTOR SYSTEM FOR PRESSES

Louis F. Carrieri, LaGrange Park, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Feb. 9, 1981, Ser. No. 232,733
Int. Cl.³ B21D *45/04*
U.S. Cl. 72—345 **25 Claims**



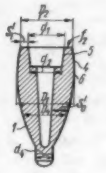
1. A hydraulic workpiece ejector system for a press having frame means supporting first tool means, slide means reciprocable through a slide stroke between first and second slide positions relative to said first tool means, said slide means carrying second tool means cooperable with said first tool means in said first slide position to perform work on a workpiece interposed therebetween, and means to reciprocate said slide means, said ejector system including ejector means associated with one of said first and second tool means and including hydraulic fluid operated ejector actuating means, relatively displaceable means including hydraulic fluid chamber means and means to vary the volume of said chamber means, said relatively displaceable means being connected between said frame means and slide means to continuously vary the volume of said chamber means in response to reciprocation of said slide means and throughout said slide stroke, and continuously open flow line means connecting said chamber means with said ejector actuating means, whereby said actuating means is displaced in an ejecting direction relative to said one tooling means during movement of said slide means from said first toward said second slide position and with a motion of displacement corresponding to the motion of displacement of said slide means.

4,370,879

METHOD FOR MANUFACTURING A PIERCING MANDREL

Boris D. Kopysky, Schelkovskoe shosse, 85, korpus 2, kv. 43; Viktor D. Dmitriev, Yasenevo, 1 Mikroraion, korpus 7"b", kv. 104, both of Moscow; Georgy I. Khaustov, ulitsa Pestelya, 21, kv. 4, Nikopol Dnepropetrovskoi oblasti; Viktor M. Brodsky, Grechesky pereulok, 14, kv. 3, Dnepropetrovsk; Vitaly A. Surzhikov, prospekt Lenina, 41, kv. 19, Nikopol Dnepropetrovskoi oblasti; Evgeny I. Semenov, ulitsa Ivana Babushkina, 3, kv. 426, Moscow; Vladimir G. Chus, prospekt Pushkina, 25/27, kv. 32, Dnepropetrovsk; Viktor A. Misjulya, prospekt Vorontsova, 75, kv. 14, Dnepropetrovsk; Leonid F. Kandyba, ulitsa Vakhrusheva, 54, Dnepropetrovsk; Igor P. Ivanov, ulitsa Ingerina, 22, kv. 5, Dnepropetrovsk; Grigory I. Bezzub, ulitsa Adreichenko, 40, Dnepropetrovsk; Yasha F. Goldenberg, ulitsa Vakhrusheva, 1, kv. 4, Dnepropetrovsk; Ilya S. Zonnenberg, Sumskoi proezd, 12, korpus 5, kv. 30, Moscow; Alexandr G. Paly, ulitsa Pestelya, 4, kv. 1, Nikopol Dnepropetrovskoi oblasti, and Arkady S. Malkin, ulitsa Pestelya, 6, kv. 1, Nikopol Dnepropetrovskoi oblasti, all of U.S.S.R.

Filed Aug. 26, 1980, Ser. No. 181,613
Int. Cl.³ B21K *5/02*
U.S. Cl. 72—377 **4 Claims**



1. A method of manufacturing a piercing mandrel being spindle-shaped in form and having an axial, dead-end conical cavity formed on the side of the mandrel fitting section, a nose formed at the end of the mandrel working section, and a sizing band arranged between the working and fitting sections, comprising:

preforming a blank with an enlarged conical cavity having dimensions greater than those of the dead-end conical cavity by way of hot piercing;

presizing said blank so that the dimensions of the enlarged conical cavity are reduced and the outer diameter of the blank, at the end face of the fitting section, is reduced to be from 0.9 to 1.02 times the diameter of the mandrel sizing band, the outer diameters of the mandrel working section and nose being from 0.9 to 1 times the diameters of the respective sections of the mandrel, and the wall thickness at the fitting and working sections being from 0.7 to 1 times the wall thickness of the mandrel; and

subjecting the presized blank to hot upset forging thereby forming the fitting section of the mandrel by deformation, simultaneously with upset forging of the working section of the mandrel, and performing final sizing of the said dead-end conical cavity of the mandrel.

4,370,880

METHOD AND APPARATUS FOR BENDING SHEET-PLATE BLANKS TO FORM SHELLS HAVING CYLINDRICAL CURVATURE

Rune Adolfsson; Gert A. Persson, and Hans A. H. Persson, all of Ystad, Sweden, assignors to AB Carbox, Ystad, Sweden

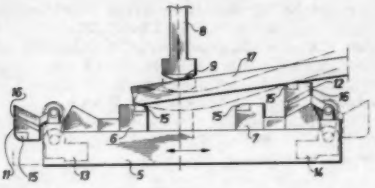
Filed Jun. 3, 1981, Ser. No. 269,877
Claims priority, application Sweden, Jun. 19, 1980, 8004571
Int. Cl.³ B21D *5/01*
U.S. Cl. 72—389 **21 Claims**

1. In a method of bending a substantially planar, plastically deformable sheet-metal blank or plate into a shell of cylindrical curvature by stepwise displacement of the plate and down-

wardly pressing said plate between normally provided first and second spaced apart die bars arranged on a die bed plate by means of a punch edge of a punch member, the punch member being arranged normally to press said plate substantially centrally between said first and second spaced apart die bars,

the improvement comprising:

when bending the end parts of the plate, locating an additional die bar at a greater distance from the end in question of said plate and at a higher level than a first one of said first and second normally provided spaced apart die bars



which is located furthest from said plate end, said additional die bar functionally replacing said first normally provided die bar; and

causing said punch member to press said plate nearer to the second normally provided die bar which is located nearest the plate end in question, so that bending of the respective end parts of the plate is carried out while downwardly pressing said plate with said punch member with the end portion of said plate supported by said second normally provided die bar and a portion of the plate spaced from said end portion supported by said additional die bar.

4,370,881

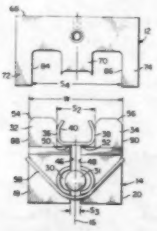
DIE SET HAVING RESILIENT WORKPIECE RETENTION MEANS

Joseph Peterpaul, West Orange, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 30, 1980, Ser. No. 221,393

Int. Cl.³ B21D *22/06*

U.S. Cl. 72—402 **15 Claims**



1. A die set for deforming a workpiece comprising:

a first die member;

an expandable and contractable die nest on said first die member;

means for biasing said die nest for securely retaining said workpiece therein; and

a second die member movable into engagement with said first die member to contract said die nest, said second die member including an anvil means movable into said contracted die nest for deforming said workpiece therein.

4,370,882

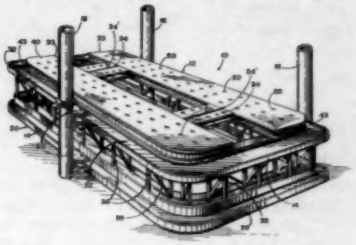
VEHICLE FRAME STRAIGHTENING APPARATUS

Claude Labbe, Duson, La. 70529

Division of Ser. No. 925,373, Jul. 17, 1978, Pat. No. 4,247,966, which is a continuation of Ser. No. 740,052, Jan. 8, 1976, abandoned. This application Jan. 9, 1981, Ser. No. 223,582

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—447 **15 Claims**



1. An apparatus for straightening damaged vehicle frames, comprising:

a. a rigid structural ramp capable of supporting a vehicle thereon;

b. a track at least partially surrounding said ramp;

c. a wheeled post movably mounted on said track for movement on said track about said ramp;

d. power means movably mounted on said post for imparting alternatively as desired a compressive force and a tensile force to the damaged frame, said power means being movable both in the horizontal and vertical planes with respect to said ramp and comprising a jack with a pressure head movably mounted on said wheel post, associated rigid means attached to said jack, and an elongated flexible member of high tensile strength attachable to said rigid means, said jack being easily convertible from a first compression position with said pressure head directed toward said ramp to a second tensile disposition, an extension of said jack being capable of applying a compression force through said pressure head to a vehicle on said ramp when said jack is in said first position, an extension of said jack also being capable of applying a tensile force to a vehicle on said ramp through said flexible means attached at one part of its length to the vehicle and attached at another part of its length to said rigid means attached to said jack when said jack is in said second disposition.

4,370,883

METHOD OF MEASURING THE POWER OUTPUT OF AN AUTOMATIVE VEHICLE ENGINE ON A ROLLER TESTING BENCH

Paul Coetsier, Chelles, and Robert Ravarotto, Villiers sur Marne, both of France, assignors to Etablissements M. Muller & Cie, Paris, France

Filed Oct. 14, 1980, Ser. No. 196,312

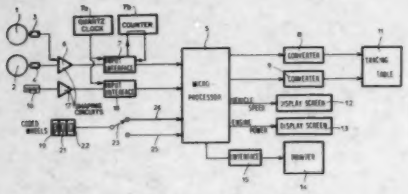
Claims priority, application France, Oct. 16, 1979, 79 25662; Aug. 6, 1980, 80 17347

Int. Cl.³ G01L *5/13;* G01M *15/00*

U.S. Cl. 73—117 **6 Claims**

1. In a method of measuring the power output of an automotive vehicle engine on a roller-type testing bench, in which the vehicle velocity and/or a number of revolutions per minute of the engine thereof at which it is desired to make the measurement are selected, the engine rotational velocity is accelerated during a first acceleration phase up to the selected value from which the power delivered to the drive wheels is measured, the engine is subsequently slightly accelerated beyond said selected velocity, whereafter the drive is disengaged and the transmission mechanism set to neutral, and the rotation of the

bench rollers is allowed to slow down until the rollers come to a standstill while they drive the engine transmission by inertia, in order to measure during this second deceleration phase the power lost in the transmission; the improvement wherein a signal generator is fitted to a measuring roller of said testing bench, the period of the electric signals emitted from said generator is measured, as a function of the variation in the



rotational velocity of the roller, by means of a quartz clock at a predetermined frequency, whereafter the power is calculated from the measured period and from the moment of inertia of the rollers, and the roller velocity is also calculated from the aforesaid period and the roller radius, said power and roller velocity being determined at predetermined time intervals during the acceleration and deceleration phases.

4,370,884

OPERATIONAL TESTING DEVICE FOR INLET VALVES AND OUTLET VALVES OF RECIPROCATING ENGINES

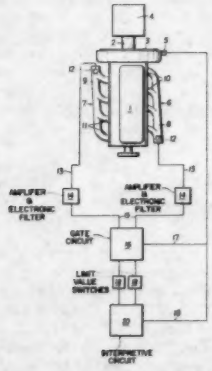
Gerhard Wöss, and Erich Schreiber, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Dec. 10, 1980, Ser. No. 215,069

Claims priority, application Austria, Dec. 19, 1979, 8022/79

Int. Cl.³ G01L *3/26, 5/13;* **G01M** *15/00*

U.S. Cl. 73—117.3 **3 Claims**



1. An operational testing device for inlet valves and outlet valves of reciprocating engines which are separately driven for an operational test, comprising at least one microphone disposed in the inlet pipe and at least one microphone disposed in the outlet pipe of the engine, combined amplifier and electronic filters to which said microphones are respectively connected, a gate circuit to which signals are forwarded from said combined amplifier and electronic filters, means supplying said gate circuit with crank angle signals from the engine, limit value switches connected to said gate circuit for the reception of the signals therefrom in a predetermined crank angle area, and an interpretive circuit connected to said switches for activation thereby when a certain, predetermined level is exceeded by the signals forwarded from said gate circuit, said means also supplying said interpretive circuit with crank angle signals from the engine, whereby said interpretive circuit allocates a signal received from said switches to one of said valves causing said received signal.

4,370,885

METHOD FOR CONTROLLING THE DISPERSING OF SOLIDS IN DRILLING MUD

Stanislav A. Alekhin, Chilanzar, kvartal 24, 53, kv. 89; Vitold M. Bakhir, proezd Gaidara, 7-A, kv. 17; Raisa I. Born, Chilanzar, kvartal 24, 53, kv. 89, and Tatyana M. Bakhir, proezd Gaidara, 7-A, kv. 17, all of Tashkent, U.S.S.R.

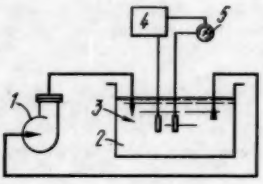
PCT No. PCT/SU79/00137, § 371 Date Sep. 16, 1980, § 102(e) Date Sep. 15, 1980, PCT Pub. No. WO80/01496, PCT Pub. Date Jul. 24, 1980

PCT Filed Dec. 29, 1979, Ser. No. 197,101

Claims priority, application U.S.S.R., Jan. 16, 1979, 2705513

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—153 **4 Claims**



1. A method for controlling the dispersing of solids in drilling mud by measuring the concentration of particles, comprising determining the concentration of particles of the solid phase by continuously measuring the variation of the mud mineralization during the course of dispersing until a point is reached at which the mineralization value is stabilized, an increase in the mineralization value indicating an increase in the concentration of particles of the solid phase, and the stabilizing of the mineralization value indicating the maximum value of the concentration of particles of the solid phase, and discontinuing the dispersing of solids when said mineralization value is substantially stabilized.

4,370,886

IN SITU MEASUREMENT OF GAS CONTENT IN FORMATION FLUID

Harry D. Smith, Jr., Houston, and Carl Dodge, Alief, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 30, 1981, Ser. No. 248,162

Int. Cl.³ E21B *49/00*

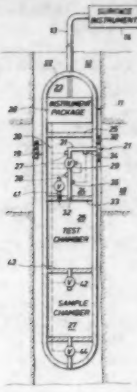
U.S. Cl. 73—153 **18 Claims**

1. A method for the insitu measurement of gas content in formation fluid comprising:

(a) positioning a test chamber in a wellbore in proximity to a source of formation fluid;

(b) passing the formation fluid from the source through an expansion type valve into a test chamber;

(c) measuring the temperature of the formation fluid upstream and downstream of the expansion-type valve; and



(d) the difference in said temperature measurements being an indicator of gas content in the formation fluid.

4,370,887

DEVICE FOR MEASURING THE MASS OF A FLOWING MEDIUM

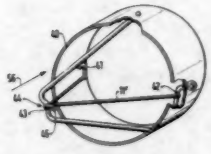
Rudolf Sauer, Benningen, and Peter Romann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,866

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003671

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **6 Claims**



1. An apparatus for measuring the mass of a flowing medium, in particular for measuring the mass of air aspirated by an internal combustion engine, including at least one temperature-dependent resistor disposed in the flow of said medium, a characteristic of which resistor is controlled in accordance with the flowing mass as a control variable, said control variable forming a standard for measuring the mass of the flowing medium, characterized in that said temperature-dependent resistor is embodied as a hot element provided with three support points disposed in a sensor means, two of said support points disposed in a plane normal to the direction of flow so that said hot element is inclined relative to the flow of the medium at an angle to the vertical which is at least 45° but less than 90°.

4,370,888

VIBRATORY WEIGHING APPARATUS

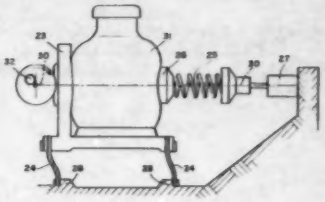
Jakhin B. Popper, Kiryat Motzkin, Israel, assignor to Popper Engineering Co., Ltd., Haifa, Israel

Filed Nov. 13, 1980, Ser. No. 206,547

Claims priority, application Israel, Nov. 23, 1979, 58783

Int. Cl.³ G01G *3/16*

U.S. Cl. 73—580 **4 Claims**



1. Weighing apparatus comprising:

means for applying force to a container partially filled with a liquid whereby force interactions between the liquid and the container are negligible for at least a predetermined measuring duration; and

means for sensing characteristics of the force applied to the container and of the motion of the container at said measuring duration for determining the tare weight of the container;

wherein said means for applying force comprises means for initially accelerating a container containing liquid and for subsequently terminating the acceleration and means for applying a braking force to the container following termination of the acceleration thereof; and wherein said sensing means comprises a first sensor for measuring said braking force and a second sensor for measuring deceleration of the container produced by the braking force.

4,370,889

TEST DEVICE FOR THE DETECTION AND ANALYSIS OF MATERIAL FAULTS

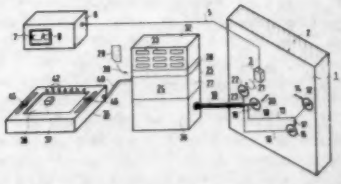
Klaus Ruthrof, and Rainer Meier, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,750

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936882

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—619 **12 Claims**



1. Test equipment for the detection and analysis of material faults in a test piece, comprising a test head, electrical remotely controlled manipulator means for moving said test head in at least two degrees of freedom, means connected to said test head for supplying said test head and evaluating signals thereof, display means connected to said test head for measuring test results thereof, means for providing said manipulator means with a testing program for automatically following a predetermined path at the surface of the test piece, an electronic transmission system connected to said manipulator

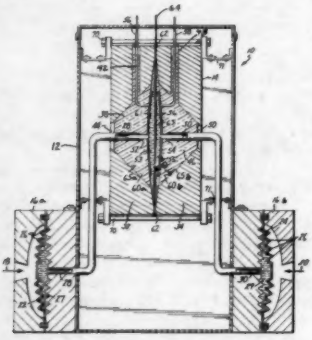
means, means connected to said electronic transmission system for simulating the test piece, and a remote controlled hand-operated guide element disposed adjacent to said display means in said simulating means for controlling said test head in correspondence to manual operation.

4,370,890

CAPACITIVE PRESSURE TRANSDUCER WITH ISOLATED SENSING DIAPHRAGM

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Oct. 6, 1980, Ser. No. 194,758
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—718 **24 Claims**



1. An improved capacitive pressure transducer having a transducer housing,

a sensor housing disposed in the transducer housing and having a central cavity,

diaphragm means supported on said sensor housing and extending across the central cavity to thereby divide the central cavity into two central chambers, said diaphragm means being deflectable under pressure and at least a portion thereof being conductive to provide a first plate of a variable sensor capacitor,

each of said chambers having a conductive surface portion spaced from the diaphragm for providing second plates of a pair of variable sensor capacitors,

a pair of isolators, said isolators each having an isolator chamber and an isolator diaphragm disposed therein,

separate passageway means coupling each isolator chamber to a separate central chamber,

means to permit applying separate pressures to the respective isolator diaphragms at a static line pressure, each isolator chamber, its associated passageway means and connected central chamber enclosing a substantially incompressible fluid such that the diaphragm means is urged to deflect and change the capacitance of the variable sensor capacitors responsive to the differential between the static line pressures applied to the isolator diaphragms,

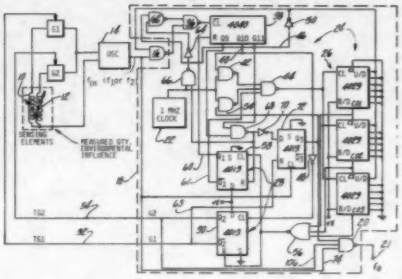
means for physically supporting the isolators in a position spaced from the sensor housing, the sensor housing and the diaphragm means being constructed so that as the sensor housing warps under increasing static line pressure levels on the isolators, the stress on the diaphragm means correspondingly changes to reduce error in capacitance caused by changing static line pressure levels as the diaphragm means deflects in response to the same dfferential in static line pressures.

4,370,891

DUAL ELEMENT-SINGLE OSCILLATOR-RATIO TYPE DIGITAL TRANSDUCER

William Pickering, University Heights, Ohio, and David J. Urbanc, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1981, Ser. No. 283,000
Int. Cl.³ G01L *19/04*
U.S. Cl. 73—861.03 **8 Claims**



1. In a measuring system having a single signal generator (**14**) connected to first and second sensing elements (**10, 12**), said generator (**14**) being adapted to deliver one of first and second signals (f_1, f_2) each being responsive to one of the first and second sensing elements (**10, 12**), said sensing elements (**10, 12**) being adapted to sense at least one variable condition at respective first and second locations and deliver a respective signal to the generator (**14**) in response to said sensed condition, the improvement comprising:

first and second gates (**G1, G2**) each connected between a respective sensing element (**10, 12**) and the generator (**14**) and each being adapted to control the delivery of the respective sensing element signal to the generator; and

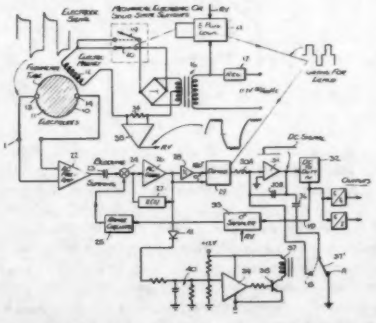
control means (**18**) for receiving the signals (f_1, f_2) from the generator (**14**) and sequentially operating the gates (**G1, G2**) in response to the period of one of the signals (f_1, f_2).

4,370,892

ELECTROMAGNETIC FLOWMETER HAVING NOISE SUPPRESSION NETWORK

Roy F. Schmoock, Yardley, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Jul. 10, 1980, Ser. No. 168,452
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.12 **9 Claims**



9. In a system in which a signal is produced which is accompanied by a noise component, a channel responsive to said signal to provide a useful output, said channel including a

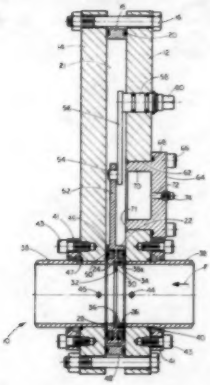
delayed action network and means that senses the signal and activates the network when the noise component thereof is excessive and persists for a predetermined period, activation of the network serving to extend the response time of the channel to thereby reduce the influence of the noise component to provide an output having a favorable signal-to-noise ratio.

4,370,893

ORIFICE METER WITH REPLACABLE ORIFICE DISC

Marvin G. Combes, Castro Valley, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Jun. 8, 1981, Ser. No. 271,637
Int. Cl.³ G01F 1/42
U.S. Cl. 73—861.61 6 Claims



1. An orifice meter comprising:

gate valve type body construction including a pair of parallel, planar walls having aligned circular flow passages therethrough;

a movable carrier between said walls;

means for moving said carrier between a first position aligned with said flow passages and a second position displaced therefrom; and

annular seal means on both sides of said carrier of a diameter greater than said flow passages and operative to maintain sealing engagement with said planar walls;

said structure being characterized in that:

said carrier has an opening therethrough and a circular recess on one side thereof of a diameter greater than said flow passages but less than said seal means;

an orifice disc received in said recess;

a seal ring around said orifice disc;

an orifice replacement opening through one of said walls aligned with said second position, said opening being of a diameter greater than that of said orifice disc but less than that of said annular seal means; and

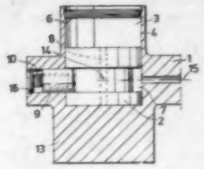
a closure member normally covering said replacement opening.

4,370,894

ECCENTRIC ELEMENT

Rune K. Sturesson, Golfbanevägen 31, Halmstad, Sweden (S-302 70)

PCT No. PCT/SE80/00179, § 371 Date Mar. 2, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00123, PCT Pub. Date Jan. 22, 1981
PCT Filed Jun. 26, 1980, Ser. No. 243,966
Claims priority, application Sweden, Jul. 4, 1979, 7905870
Int. Cl.³ F16H 33/10
U.S. Cl. 74—87 8 Claims



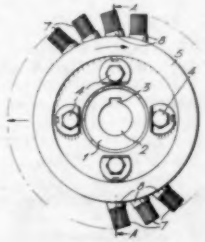
1. An eccentric element intended for ground vibrators, said element including a radially movable eccentric mass (2) arranged on a rotatable shaft (1), said mass being able to assume an inward position and as a result of the rotation of the shaft an outward position in which the distance between the centre of gravity (14) of the eccentric mass and the centreline (15) of the rotating shaft is larger than in the inward position, characterized in that the eccentric mass (2) is lockable in both its inward and outward position by the action of a displaceable locking piston (9) arranged in a recess (16) in the rotating shaft (1), and which can be manoeuvered to assume a position entirely thrust back into the recess (16) wherein the eccentric mass (2) is released, or a thrust-out position in which the locking piston (9) locks the eccentric mass (2) in its inward or outward position enabling the eccentric mass to be in its position independent of the speed of rotation of the shaft (1).

4,370,895

FRICTION DRIVE WHEELS

David M. Wright, Newcastle-upon-Tyne, England, assignor to British Gas Corporation, London, England

Filed Nov. 30, 1979, Ser. No. 98,823
Claims priority, application United Kingdom, Jan. 25, 1979, 7902618
Int. Cl.³ F16H 55/32; B60B 15/00
U.S. Cl. 74—216 12 Claims



1. A friction drive wheel adapted to be mounted upon a pipeline inspection pig for continuous rotation about an axis perpendicular to the normal direction of movement of the pig as the latter moves longitudinally through a pipeline, said wheel being adapted to rotate with its circumferential periphery in frictional contact with the interior surface of the pipeline during said movement, said wheel having surface-engaging

means comprising a plurality of bristles mounted with their longitudinal axes arranged in one or more planes extending normally of the axis of rotation of the wheel and with said longitudinal axes inclined at an acute angle relative to a line extending perpendicularly through said axis of rotation.

4,370,896

REVERSING DEVICE FOR A GEAR TRANSMISSION

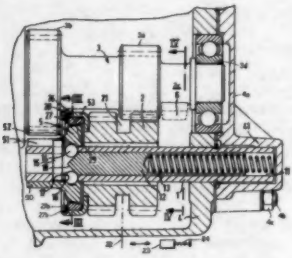
Udo Markfeld, and Siegfried Wintergerst, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,023

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939713

Int. Cl.³ F16H *3/38*; F16D *23/06*; B60K *41/26*

U.S. Cl. 74—339 **11 Claims**



1. In a transmission having a housing, a drive train in said housing including a drive gear, a fixed shaft in said housing, an output shaft extending into said housing, a reversing gear connectible with said output shaft, and a sliding gear rotatable and axially shiftable on said fixed shaft and movable into and out of mesh with said reversing gear while continuously meshing with said drive gear, the improvement which comprises:

a synchronizing ring axially and rotationally fixed to said sliding gear;

a synchronizing member rotationally fixed to said fixed shaft but axially shiftable thereon and frictionally engageable with said retaining ring to brake rotation of said sliding gear;

detent means on said shaft impeding axial entrainment of said member with said ring upon movement of said sliding gear toward meshing engagement with said reversing gear; and

means for discontinuing frictional engagement between said ring and said member upon movement of said sliding gear into mesh with said reversing gear.

4,370,897

DUAL MODE SHIFTER FOR AUTOMATIC TRANSMISSIONS

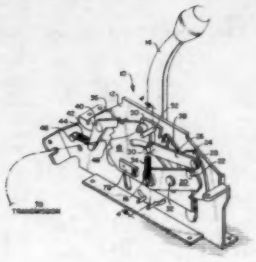
Louis D. Carlo, Litchfield, Ohio, assignor to American Industries, Inc., Cleveland, Ohio

Filed Sep. 22, 1980, Ser. No. 189,430

Int. Cl.³ G05G *7/06*, *9/06*

U.S. Cl. 74—475 **44 Claims**

1. A shifter for an automatic transmission comprising ratchet means operable to control said transmission through certain of its gears in a ratchet mode of operation and gate means operable to control said transmission through others of its gears in a gate mode of operation, said shifter further comprising a main frame and a handle, means to mount said handle on said main frame to permit said handle to control said ratchet means and said gate means and to move between controlling said ratchet means and said gate means, said ratchet means comprising ratchet teeth and a ratchet pawl, said ratchet pawl being mounted in link means, said link means being controlled by said handle means so that said pawl cooperates with said ratchet teeth when said shifter is operated in said ratchet mode, and said link means being operative to keep said pawl out of operative engagement with said ratchet teeth when said shifter is operated in said gate mode.



4,370,898

ADJUSTABLE FASTENING DEVICE

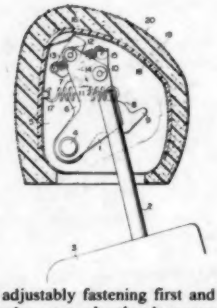
Katsuaki Maruyama, Toyota, Japan, assignor to Toyoto Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 20, 1980, Ser. No. 179,751

Claims priority, application Japan, Aug. 27, 1979, 54-118324[U]

Int. Cl.³ G05G *5/24*; A47C *7/38*

U.S. Cl. 74—540 **6 Claims**



1. A device for adjustably fastening first and second relatively rotatable members to each other between first and second relative rotational positions, said device comprising a ratchet member fixed to said first member and having a plurality of ratchets arranged along an arc having its center at the pivoting axis of said first and second members, a pawl member movably supported by said second member and engaging said ratchets so as to allow said first member to rotate relative to said second member in a first direction toward said first relative rotational position but to prevent said first member to rotate relative to said second member in a second direction opposite to said first direction toward said second relative rotational position, a pawl disengaging means which removes said pawl member from engagement with said ratchets when said first and second members have been brought to said first relative rotational position, a control member which engages said pawl member so as to hold said pawl member as disengaged from said ratchets until said first and second members are brought to said second relative rotational position wherein said control member is a hook-like member pivotably supported by said second member having an edge portion, said pawl member has an edge portion adapted to engage said edge portion of said control member when said pawl member has

been disengaged from said ratchets by said pawl disengaging means, a spring mounted between said pawl member and said control member, said spring biasing said pawl member so as to resiliently drive said pawl member toward engagement with said ratchets while said spring also biases said control member so as to resiliently drive said edge portion of said control member toward engagement with said edge portion of said pawl member, and a control releasing means which releases said control member from said pawl member when said first and second members have been brought to said second relative rotational position so that said pawl member again engages said ratchets.

4,370,899

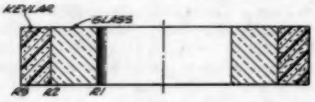
FLYWHEEL FOR KINETIC ENERGY STORAGE

Bruce E. Swartout, San Juan Capistrano, Calif., assignor to U.S. Flywheels, Inc., Irvine, Calif.

Division of Ser. No. 942,112, Sep. 13, 1978, Pat. No. 4,285,251. This application Jul. 21, 1980, Ser. No. 170,463

Int. Cl.³ G05G *1/00*

U.S. Cl. 74—572 **3 Claims**



1. A flywheel for storing kinetic energy and comprising:

a double spider configuration hub having a pair of coaxial, oppositely facing, spaced-apart convex surfaces of substantially equal dimensions, said surfaces being interconnected by a plurality of legs spaced equidistantly around the perimeter of said hub; and

each of said legs having a circumferential outward facing surface for support of a cylindrical flywheel rim, the axis of which is collinear with the axes of said convex surfaces;

a unitary, thick rim, concentrically supported on said leg surfaces and having a first combination on fiber and epoxy matrix wound onto a substantially cylindrical configuration having an inner radius R1 and an outer radius R2 and

a second combination of fiber and epoxy matrix wound into a substantially cylindrical configuration having an inner radius R2 and an outer radius R3;

the mass density per unit volume of said first combination being greater than the mass density per unit volume of said second combination; and

the elastic modulus of said second combination being greater than the elastic modulus of said first combination.

4,370,900

TORSIONAL OSCILLATION DAMPER FOR COMBUSTION-ENGINE CRANKSHAFT

Helmut Hartz, Hedwigstr. 24, 4690 Herne, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,357

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920125

Int. Cl.³ F16F *15/10*

U.S. Cl. 74—574 **5 Claims**

3. A torsional oscillation damper comprising:

a relatively light annular disk centered on and rotatable about an axis;

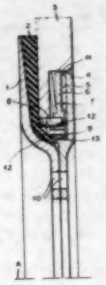
a rigid abutment disk centered on and rotatable about said axis, said abutment disk being spaced axially from said light disk;

a relatively heavy annular disk centered on and rotatable about said axis independently of at least one of said light and abutment disks, said abutment disk being fixed axially and rotationally to one of said light and heavy disks;

an annular soft elastomeric ring engaged between said light and heavy disks;

a ring of friction material engaged axially between said abutment disk and one of said light and heavy disks; and

spring means for urging said ring of friction material axially against one of the respective disks it engages axially and for rotationally coupling said ring of friction material to the other respective disk it engages axially, said spring means including:



a pressure ring rotationally linked to said other disk and to said ring of friction material and axially displaceable relative to said disks, said other disk and said pressure ring being formed with respective axially aligned holes,

at least one spring between said pressure ring and said other disk, and

respective pins each extending axially through a respective one of the holes of said other disk and the respective hole of said pressure ring.

4,370,901

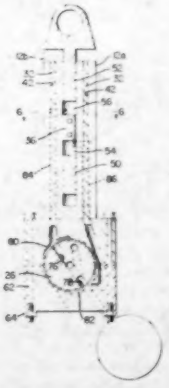
CONNECTING ROD WITH VARIABLE LENGTH

Ralph A. Bolen, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio

Filed Jan. 5, 1981, Ser. No. 222,327

Int. Cl.³ G05G *3/00*; F02B *75/04*

U.S. Cl. 74—586 **21 Claims**



1. An extendable piston rod, comprising:

(a) a housing, said housing being rotatably attachable to a crankshaft;

(b) a connecting rod including:

(i) a first portion rigidly attached to said housing; and

(ii) a second portion movably interconnected to said first portion;

(c) a first variable volume chamber interposed between said first and second portions of said rod, one end of said first variable volume chamber being rigidly affixed to said first portion of said rod and the other end being rigidly affixed to the second portion but movable relative to said first portion, said first variable volume chamber having an increasing volume as said second portion of said rod is moved relative to said first portion in a predetermined direction and a decreasing volume as said second portion of said rod is moved relative to said first portion in a direction opposite said predetermined direction;

(d) a second variable volume chamber interposed between the first and second portions of said rod, one end of said second variable volume chamber being rigidly affixed to said first portion of said rod and the other end being rigidly affixed to said second portion but movable relative to said first portion, said second variable volume chamber having an increasing volume as said second portion of said rod is moved relative to said first portion in a direction opposite said predetermined direction and a decreasing volume as said second portion of said rod is moved relative to said first portion in said predetermined direction; and

(e) means for alternately providing selective fluid communication between each of said variable volume chambers and a pressurized fluid source while simultaneously providing fluid communication between the other of said variable volume chambers and a fluid exhaust in accordance to the relative angular position of the housing to a crankshaft.

4,370,902

DRIVE MECHANISMS, MORE PARTICULARLY FOR VALVE ACTUATORS

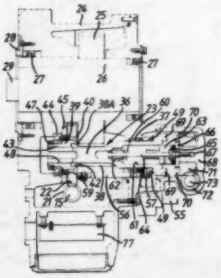
Jeremy J. Fry, and Peter R. Smith, both of Lower Weston, England, assignors to Rotork Controls Limited, Bath, England

Filed Sep. 25, 1980, Ser. No. 190,879

Claims priority, application United Kingdom, Sep. 28, 1979, 7933691

Int. Cl.³ F16H *35/00*

U.S. Cl. 74—625 **8 Claims**



1. A motorised actuator comprising a driven shaft, a motor for driving said driven shaft, an output shaft, and an intermediate shaft assembly, said motor driven shaft being drivably connected with the shaft of said intermediate shaft assembly by a wormgear mesh comprising a worm on said motor driven shaft and a wormwheel on said intermediate shaft, a pinion member slidably mounted on said intermediate shaft and formed with a plurality of elongated teeth at all times in driving engagement with an output gear on said output shaft, a plurality of recesses formed in said wormwheel, said pinion member being slidably relative to said output gear for drivably engaging the teeth of said pinion member with the recesses in said wormwheel, and a clutching mechanism for selectively moving said pinion member slidably into and out of driving engagement with said wormwheel so as to permit independent operation of said intermediate shaft assembly and thereby said output shaft by manual means, characterized in that the ends of selected teeth on said pinion member are extended for engagement with the recesses in said wormwheel, and that the width of each recess is substantially larger than the width of the extended teeth of said pinion member.

4,370,903

METHOD AND APPARATUS FOR COMPUTING MOTOR SPEEDS FOR INITIATING AND ENDING JOLT CONTROL DURING GEARSHIFT IN A DRIVE SYSTEM USING FLUID COUPLINGS OR TORQUE CONVERTERS

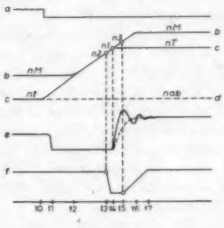
Walter Stroh, Cleebronn, and Manfred Schwab, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,130

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934477

Int. Cl.³ B60K *41/08*

U.S. Cl. 74—858 **11 Claims**



9. In a drive system having a motor, hydraulic coupling means driven by said motor, automatic transmission means driven by said hydraulic coupling means and operable in a plurality of selectable gear ratios, and means for furnishing a first signal indicative of the output speed (nab) of said automatic transmission means a second signal indicative of the then-engaged gear and a third signal indicative of initiation of a gearshift, the improvement comprising

apparatus for furnishing a fourth and fifth signal respectively initiating and ending an externally controlled reduction of output torque of said motor for decreasing jolts during a gearshift, comprising

first computing means (1) having speed ratios corresponding to each of said selectable gear ratios stored therein, for multiplying said first signal by a selected one of said speed ratios, thereby creating a synchronous speed signal;

second computing means (2) connected to said first computing means for computing a first and second (n2, n3) desired motor speed signal in dependence upon said synchronous speed signal and a first and second speed increment signal ($\Delta 1n$, $\Delta 2n$); and

means (3) for furnishing said fourth and fifth signals when the speed of said motor is equal to said first and second desired motor speeds, respectively.

4,370,904

METHOD AND APPARATUS FOR CONTROLLING THE TORQUE OF AN INTERNAL COMBUSTION ENGINE

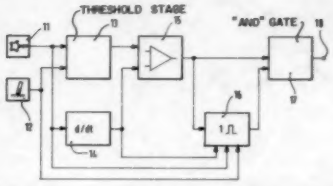
Alfred Müller, Leonberg; Manfred Schwab, Gerlingen, and Walter Strob, Cleebronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,569

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018033

Int. Cl.³ B60K *41/08*

U.S. Cl. 74—858 8 Claims



1. In an internal combustion engine having an automatic transmission and means for decreasing the output torque of said engine in response to a torque reducing signal;

apparatus for generating said torque reducing signal whenever a gear-shifting operation of said automatic transmission takes place, comprising

first means (11,14) for generating a deceleration signal corresponding to the rate of decreases with respect to time of the speed of said internal combustion engine; and

second means (11,12,13) for generating a reference deceleration signal value representative of a threshold below which the value of deceleration is too low to correspond to the occurrence or imminence of a gear-shifting operation of said transmission;

third means (15,16,17) connected to said first and second means for furnishing said torque reducing signal when said deceleration signal is indicative of an engine deceleration exceeding said reference deceleration signal value.

4,370,905

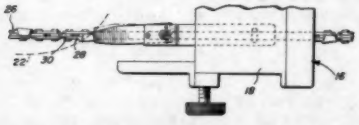
CHAIN TOOTH LOCATOR

Jack F. Simington, Star Rte., Box 141, Chiloquin, Oreg. 97624

Filed Jul. 15, 1980, Ser. No. 168,357

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—74 9 Claims



1. In combination with a support structure defining an elongated guide groove for slidingly receiving, guidingly engaging and supporting the guide lugs of an elongated saw chain section for selective positioning of the chain section along the groove, a tooth locator for engaging successive tooth equipped links of the chain section and positioning the links in predetermined position along the groove to be similarly engaged and sharpened by a rotary grinding wheel mounted for guided movement in a predetermined path relative to said support structure, said tooth locator including a mount supported from said support structure, said tooth locator including an elongated support arm having one end supported from said mount, an elongated finger, mounting means pivotally mounting one end of said finger from the other end of said arm for limited angular displacement of said finer relative to said arm about an axis at least closely adjacent and generally paralleling a plane containing said groove and paralleling the direction in which said groove opens, said finger being displaceable relative to said arm between positions slightly oppositely inclined relative to said plane, said arm and said finger including coacting detent means operative to releasably retain said finger in each of said oppositely inclined positions.

4,370,906

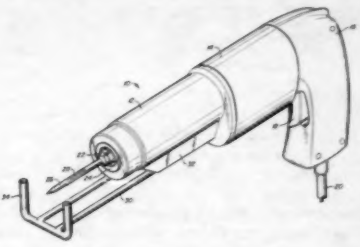
SEQUENCED FASTENER INSTALLATION SYSTEM

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Filed May 5, 1980, Ser. No. 146,809

Int. Cl.³ B25B *19/00*

U.S. Cl. 81—464 11 Claims



1. Apparatus for installing an elongate fastener which is at least partially threaded in a workpiece, said apparatus comprising:

a mass reciprocatable along a linear path;

means for resiliently mounting the mass so that the mass is reciprocatable at a resonant frequency;

means for exciting the mass so that the mass reciprocates at at least near its resonant frequency;

a chuck having a front portion adapted to releasably support the fastener and a back striking surface;

means for locating the chuck so that the reciprocating mass intermittently impacts the back striking surface of the chuck to drive the fastener into the workpiece so that the threaded portion of the fastener at least partially engages the workpiece;

means for rotating the front portion of the chuck after the fastener is driven partially into the workpiece to correspondingly rotate the fastener and complete the installation of the fastener in the workpiece; and

a control rod projecting forwardly from the locating means, said control rod being movable along an axis parallel to the linear path and having a forward end adapted to engage the workpiece so that movement of the locating means toward the workpiece moves the control rod, and a plurality of switches activated by movement of the control rod to activate and de-activate the exciting means in sequence.

4,370,907

POSITIVE STOP CENTER

Leo C. Felice, P.O. Box 904, Woonsocket, R.I. 02895

Filed Nov. 5, 1980, Ser. No. 204,335

Int. Cl.³ B23B *23/02*

U.S. Cl. 82—33 R 3 Claims

1. A system for accurately positioning and locating a workpiece in a machine tool, said system being employed at the headstock spindle of the machine tool, comprising:

a master sleeve shaped for frictional engagement by said headstock spindle, and having a tapered cavity therein;

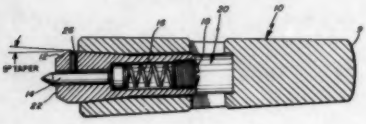
an interchangeable center housing shaped for frictional engagement with, and quick release from, the walls of said cavity, having a shoulder against which said workpiece

rests when located and positioned in said machine tool, and having a passage therethrough;

removable securing means forming a mechanical seal at one end of said passage;

a center pin slidably mounted within said passage, a first end of said pin projectable out of said housing and said passage and beyond said shoulder, for engagement with the center hole at one end of said workpiece; and

spring means located in said passage, one end of said spring means being positioned against said securing means, the other end being in contact with the second end of said



center pin, for urging the first end of said center pin into a position normally extended beyond said shoulder, said spring means being compressible when the workpiece is positioned and located on the center pin at the headstock of the machine tool;

wherein said passage includes an enlarged chamber, the second end of said center pin comprises an enlarged head projecting into said chamber, said securing means forms the innermost wall of said chamber, and said enlarged head is pushed against the opposite wall of said chamber by said spring means when the center pin is in normal position.

4,370,908

CUTTING HEAD FOR FILTER ASSEMBLER

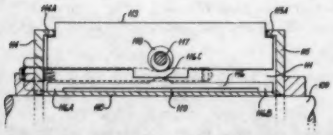
Michael E. DeAlto; Joseph D. DiGiacomo; Clifford R. Marritt, all of Richmond, Va., and Edward G. Preston, London, England, assignors to Molins Limited, London, England

Filed Apr. 7, 1980, Ser. No. 138,092

Claims priority, application United Kingdom, Apr. 5, 1979, 7912075

Int. Cl.³ B23D *25/02, 35/00*

U.S. Cl. 83—348 **5 Claims**



1. A cutting head for a filter attachment machine comprising a drum carrying a plurality of knives each of which is urged radially outwards by at least one spring against an adjustable retaining device which limits radially-outward movement of the corresponding knife and includes adjustment means for adjusting the outer limiting portion of the knife, said spring comprising a resilient beam which extends along a radially-inner face of the knife and is resiliently flexed, and is arranged to engage the knife so as to urge it radially outwards, and further including a central fulcrum about which each knife can pivot with respect to the cutting head.

4,370,909

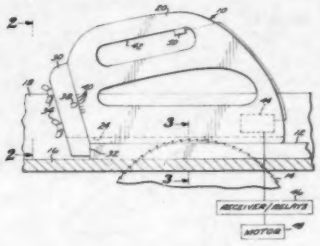
HAND GUARD FOR TABLE MOUNTED CUTTING TOOL

G. Craig Jennings, 2225 Laguna Canyon Rd., Laguna Beach, Calif. 92651

Filed Mar. 6, 1981, Ser. No. 241,244

Int. Cl.³ B27B *25/10*

U.S. Cl. 83—437 **5 Claims**



1. A hand guard for a table mounted rotating cutting tool, said hand guard comprising:

a vertically oriented guide body having flat side portions for slidable engagement with a table mounted guide rail of predetermined height, and including an underside adapted to rest on top of work to be advanced past a rotating cutting tool and along a path parallel to said guide rail, said guide body further having an elongated hand slot extending through said flat side portions and sloping upwardly in a leading direction whereby said guide body can be manually thrust in said leading direction with a vector of said thrust tending to press said guide body downwardly upon said work, said hand slot being adapted for location above said predetermined height of the guide rail whereby a user's hand will clear the upper edge of said guide rail;

a heel mounted to the trailing extremity of said guide body for generally vertical movement to project the lower extremity of said heel below said guide body underside for positive engagement with the edge of said work whereby said work may be moved past said cutting tool by manually grasping the upper portion of said guide body and moving it toward said cutting tool, said lower extremity of said heel including a channel to accommodate a cutting tool passing upwardly of said underside of said guide body during ripping of said work; and

adjustment means on said heel and said guide body cooperative to fix said heel in one of various vertically adjusted positions relative to said guide body to accommodate various thicknesses of work.

4,370,910

METHOD AND APPARATUS FOR CUTTING METAL PIECES INTO NARROWER WIDTHS

Yasuo Suzuki; Shuji Nagata, and Kazumi Yasuda, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

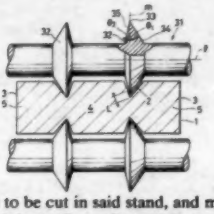
Filed Dec. 30, 1980, Ser. No. 221,413

Int. Cl.³ B23D *19/06*

U.S. Cl. 83—876 **2 Claims**

1. An apparatus for cutting a relatively hot metal piece having a rectangular cross-section into three or more narrower widths by cutting through the thickness of said metal piece, which apparatus comprises: a knifing roll stand having a pair of rotatable knifing rolls, one placed above the other, each knifing roll having a plurality of annular wedges therearound and spaced from each other along the roll in the direction of the axis thereof, there being two of said wedges which are outer wedges, being closer to the respective ends of said roll, the flanks of said outer wedges being at an angle to a plane through

the wedges and perpendicular to the axis of said knifing roll, the angle of the flank of the flanks of each of said outer wedges which is toward the roll end being an angle θ_1 which is greater than the angle θ_2 of the opposite flank of said outer wedges, the angle α of said outer wedges which is the sum of the angle θ_1 and the angle θ_2 being between 30 and 90 degrees, and the flank angle θ_1 being equal to 0.52α to 0.92α, and the pointed end of each outer wedge being flattened and having a width ϵ equal to 0.01H to 0.04H, where H is the maximum thickness of



the metal piece to be cut in said stand, and means at the entry and exit sides of the knifing roll stand for transferring a metal piece to be cut through the stand in the longitudinal direction of the piece, whereby sufficient metal in the outermost cut widths and adjacent the cuts between the outermost cut widths and the next adjacent inner cut widths being caused to flow in the direction of the length of the cut widths to substantially eliminate the curvature in the direction of the width of the cut widths when the cut widths are rolled to rectangular cross-sectional shapes.

4,370,911

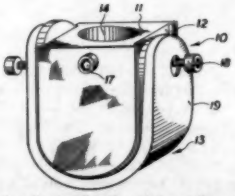
POINTLESS END PIN ADAPTOR FOR THE VIOLONCELLO AND THE STRING BASS

Richard Goldner, 3717 Toad Lake Rd., Bellingham, Wash. 98226

Continuation-in-part of Ser. No. 225,845, Jan. 16, 1981. This application Jan. 27, 1982, Ser. No. 343,232

Int. Cl.³ G10G *5/00*

U.S. Cl. 84—280 **6 Claims**



1. An end pin adaptor for the violoncello and the string bass comprising a receiving member having an arcuate support portion at one of its ends and a cavity opening at its other end adapted to receive the end pin of a violoncello or string bass, a locking means adjustably positioned on said receiving member to lock said member to an end pin positioned in said cavity and at least one flexible overlay positioned over said arcuate support portion of the receiving member.

4,370,912

SOUND PRODUCING INSTRUMENT

Christopher Glynn, 22 Brookwood Rd., Artane, Dublin, Ireland

Filed Mar. 16, 1981, Ser. No. 244,113

Int. Cl.³ G10D *13/06*

U.S. Cl. 84—418 **13 Claims**

1. In combination,

(1) a musical percussion instrument comprising:

(a) a staff having a central portion, an upper end portion, and a lower end portion,

(b) a plurality of pins supported at the upper end portion of the staff, and

(c) a plurality of sound producing elements supported on each pin, and

(2) a toothed rod for drawing across said central portion of the staff so that successive teeth on the rod impart to the staff a succession of impacts;

the instrument being capable of producing three different beats, each beat being independent of each other beat, the first beat being produced by striking the lower end portion of the staff rythmically against the ground whilst the staff is held generally vertically, the second beat being produced by oscillating the upper end portion of the staff about its vertical axis, and the third beat being produced by drawing the toothed rod across the central portion of the staff, the instrument also being capable of producing any combination of two said beats simultaneously, or all three beats simultaneously.

4,370,913

AMMUNITION HANDLING SYSTEM

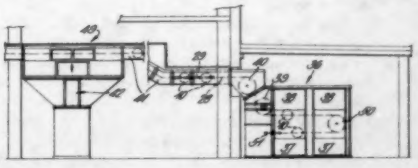
George T. Gough, Newcastle, England, assignor to Gough & Co. (Hanley) Ltd., Staffordshire, England

Filed Sep. 22, 1980, Ser. No. 189,041

Claims priority, application United Kingdom, Jun. 2, 1980, 8017981

Int. Cl.³ F42B *33/00*

U.S. Cl. 86—45 **5 Claims**



1. An ammunition handling system comprising a carrier for holding ammunition, conveyor means connected to said carrier for moving said carrier and thus conveying ammunition along a predetermined path, cooperating means on said carrier and along said path for arresting and holding said carrier level during a loading operation and an automatic tipping mechanism for engaging said carrier to cause said carrier to revolve slowly and thus gently discharge the ammunition at a selected point along said path, said carrier including an inner liner assembly contoured to receive ammunition in a first orientation

of said carrier for smoothly and gently discharging ammunition when said carrier is tipped from said first orientation, said inner liner assembly having a shape defining means for receiving and holding an open top ammunition box while allowing the contents of such ammunition box to individually discharge when the carrier is tipped.

4,370,914

AIMING ARRANGEMENTS

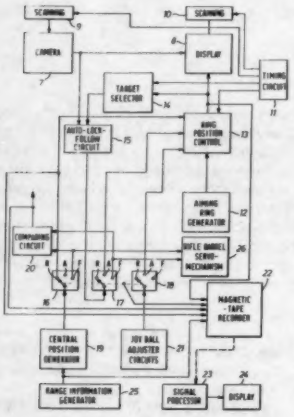
Roger Voles, London, England, assignor to E M I Limited, Hayes, England

Filed Apr. 6, 1978, Ser. No. 895,488

Claims priority, application United Kingdom, Apr. 7, 1977, 14729/77

Int. Cl.³ F41G 1/00

U.S. Cl. 89—41 TV **19 Claims**



1. A gun aiming arrangement comprising:

(a) camera means for receiving an image of a target area and adapted to sample the image to produce signals representing the image;

(b) means for indicating the target area to an operator;

(c) an auto-lock-follow circuit,

(d) a target selecting means for rendering the auto-lock-follow circuit preferentially sensitive to a selected zone of the area;

(e) manually operable means for causing the selecting means to select the said zone of the area;

the auto-lock-follow circuit being connected to receive the signals from the camera and means being connected to the selecting means to respond to the said signals and the selected zone to indicate the position of the said zone in the target area;

(f) means responsive to the auto-lock-follow circuit to produce a firing signal for firing the gun when the deviation of the indicated position from the aim of the gun has a predetermined characteristic; and

(g) manually operable switching means for selectively connecting the auto-lock-follow circuit to the firing signal producing means.

4,370,915

TOOTH FOR RAMMING UNIT

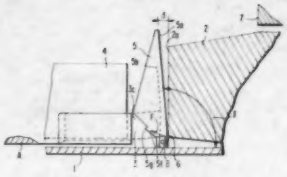
Olle Gustavsson, and Göran Sundmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,636

Claims priority, application Sweden, Dec. 18, 1979, 7910438

Int. Cl.³ F41F 9/00

U.S. Cl. 89—47 **9 Claims**



1. In a ramming unit for an artillery piece, an improved mechanism for displacing a shell from a loading tray and permitting a charge to be loaded behind said shell comprising:

a journal for supporting a tooth member to a table of said ramming unit;

a tooth member formed as a trough carrying a welt, connected to said journal, said tooth member being swingable from a vertical position for engaging said shell to a horizontal position for engaging said charge, said tooth member having a forward surface facing said shell rear surface during its vertical position which contacts said shell at a lower portion thereof, and forms an acute angle with said shell, said tooth member having a second surface forming an acute angle with said forward surface at said journal and extending rearward thereof, said second surface including first and second force relieving surfaces;

third and fourth relieving surfaces on a movable ram unit for engaging said second surface first and second force relieving surfaces, whereby forward motion of said movable ram applies a force to said tooth member for forcing said shell into said artillery piece; and

said tooth member in said horizontal position permitting said charge to be received in said trough and engaged by a welt in said trough, whereby said charge is withdrawn in response to movement by said movable ram to a preferred location for firing.

4,370,916

PERCUSSIVE DEVICE

Leonid A. Mitin, Morskoi prospekt, 62, kv. 12; Vladislav V. Mitrofanov, Morskoi prospekt, 19, kv. 11; Vladimir Y. Fadeev, ulitsa Tereshkovoi, 6, kv. 180; Petr Y. Fadeev, ulitsa Russkaya, 25, kv. 204; Vladlen V. Korobkov, ulitsa Shljuzovaya, 12, kv. 17; Rim A. Kulagin, ulitsa Tereshkovoi, 2, kv. 22; Anatoly A. Vorozheikin, ulitsa Tereshkovoi, 24, kv. 8; Nikolai P. Ermilov, ulitsa Rossiiskaya, 12, kv. 56; Jury V. Smirnov, ulitsa Ekvatornaya, 1, kv. 170, and Ivan A. Besedin, ulitsa Tereshkovoi, 12, kv. 91, all of Novosibirsk, U.S.S.R.

Filed Oct. 4, 1979, Ser. No. 81,915

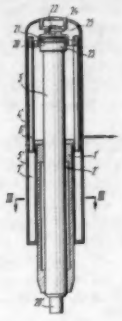
Int. Cl.³ F03C 1/04; F01L 19/02; F04B 1/00

U.S. Cl. 91—173 **5 Claims**

1. A percussive device for transmitting impact pulses, which device comprises:

a housing; a striker having a tail portion, said striker being reciprocatingly supported in said housing and operative to transmit impact impulses to a medium being worked; a power cylinder connected to said housing and accommodating during reciprocation, said tail portion of the striker; means for introducing into said power cylinder a fluid medium under pressure, which fluid medium being capable of storing potential energy when compressed during a backward stroke of said striker and acting upon the end of said striker tail portion during a forward stroke of said

striker; an arresting mechanism including means for interacting with said striker during its backward stroke; a striker backward-stroke drive comprising hydraulic cylinders separate from said housing and said power cylinder and spaced radially outward from the axis of said striker, each hydraulic cylinder having an opening formed therein in communication with the power cylinder, a rod in each hydraulic cylinder connected to said arresting mechanism,



the relationship between the opening in each hydraulic cylinder, the rods, and the power cylinder being such that said rods move said arresting mechanism into engagement with said striker under the pressure of the fluid medium, each of said hydraulic cylinders being selectively connectable with a pressure source and a pressure medium exhaust line, connection of said hydraulic cylinders with the pressure source effecting a backward stroke of said arresting mechanism jointly with said striker.

4,370,917

PISTON-RACK ROTARY ACTUATOR

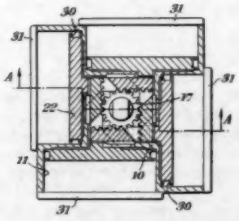
Alan D. Bunyard, 46, Sunnydale Ave., Patcham, Brighton, East Sussex, England

Filed Jul. 8, 1980, Ser. No. 166,773

Claims priority, application United Kingdom, Jul. 14, 1979, 7924621

Int. Cl.³ F01B *1/06, 7/04*

U.S. Cl. 91—491 **16 Claims**



1. A piston-rack rotary actuator comprising a body (10) in which an output shaft (13) is supported for angular movements about its axis of rotation, wherein said shaft has a gear (16) intermediately of its ends, wherein pistons (22) having integral toothed racks (24) in mesh with said gear (16) are displaceable along the respective cylinders (11) in said body (10) under the influence of a pressurized fluid medium with resultant angular movement of the output shaft (13) about its axis of rotation;

characterized in;

that there are four pistons (22) arranged in serial order circumferentially around said gear each of which is accommodated in a respective one of four cylinders (11);

said pistons and said cylinders being arranged in two opposite pairs with respect to said gear and said pistons being arranged for simultaneous displacement radially of said gear along their said respective cylinders under the influence of said pressurized fluid medium;

that each one of the integral toothed racks (24) of said pistons meshes respectively with one portion of one of two sets of diametrically opposed teeth on said gear (16); and

that pressurized fluid medium supply means (33 to 37) are provided to facilitate the supply of said medium to corresponding one or other faces of said pistons (22) simultaneously in order to move said pistons to simultaneously drive said gear while said pistons are moving in four different directions.

4,370,918

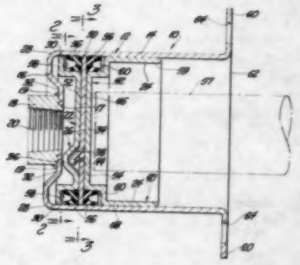
FLUID CYLINDER ASSEMBLY

William L. Pringle, 999 Lake Shore Rd., Grosse Pointe Shores, Mich. 48236

Filed Mar. 24, 1980, Ser. No. 132,716

Int. Cl.³ F16J *9/00*

U.S. Cl. 92—163 **13 Claims**



1. A fluid cylinder assembly (10) comprising; a cylinder housing (12) including a cylindrical wall portion (14) and a closed end portion (16) having fluid inlet means (18) for receiving a supply of fluid therethrough, a piston assembly including a pressure wall (22) facing said closed end portion (16) and side walls (24) for sliding engagement within said cylindrical wall portion (14) of said cylinder housing (12), characterized by said pressure wall (22) including first projection means (26) extending from said pressure wall (22) for abutting said closed end portion (16) of said cylinder housing (12) so as to prevent said piston assembly from completely engaging said closed end portion (16), said piston assembly including an end piece member (34) defining said pressure wall (22), said first projection means (26) including at least one integral male portion (36) extending from one surface of said end piece member (34) and defining a female portion (38) on the opposite surface of said end piece member (34), and cup means (40) defining said side walls (24) and including bottom wall means (42), said bottom wall means (42) including second projection means (44) extending from said bottom wall means (42) for engaging said female portion (38) of said projection means (26) of said end piece member (34).

4,370,919

VENT CAP ASSEMBLY FOR A MONITORING WELL

Walter R. Wagner, Minneapolis, and Richard M. Duda, Maplewood, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

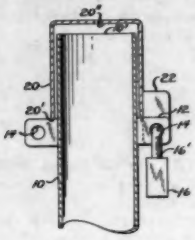
Filed Jan. 29, 1981, Ser. No. 229,392

Int. Cl.³ F23L *17/02*

U.S. Cl. 98—122 **2 Claims**

1. A venting cap assembly system for protecting the upper end of a monitoring well riser pipe from contamination, said system comprising a first tab member attached to the side of the riser pipe at a predetermined distance from its top, a hollow

cap member having an inner diameter which is slightly greater than the outer diameter of said riser pipe upon which said cap is placed by an amount sufficient to provide a venting passageway which is open at all times, a second tab member integrally attached to said cap member, an aperture in each of said tab members which is sized so as to be capable of receiving a padlock and positioned so that the apertures can be aligned



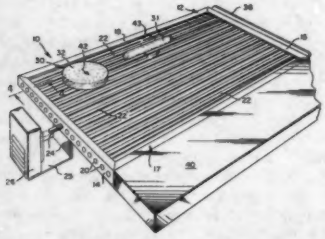
with each other when the cap member is assembled over the top of said riser pipe with the tab members immediately adjacent one another and when the cap is resting on the first tab, said cap member having cylindrical internal side wall portions which are at least sufficiently longer than said predetermined distance that the inner end surface of said cap will be vertically spaced from the upper end of said riser pipe when said cap member is resting on said first tab member.

4,370,920

ROTATING BARBECUE GRILL

Joseph Henriques, 32 Hidden Brook Dr., Brookfield, Conn. 06804, and Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Oct. 17, 1977, Ser. No. 842,617
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—339 **11 Claims**



1. A rotating barbecue grill for use with a motor, comprising:

(A) a peripheral framework including two oppositely positioned apertured side members parallel to each other with their respective apertures aligned with each other;

(B) an elongated substantially cylindrical member rotatably mounted through aligned apertures in said side members, having a first end protruding outwardly from the first side member, said first end shaped for removable continuous rotational driving engagement by said motor, and having its other end protruding from said second side member, with either end having a crank-like portion;

(C) a plurality of elongated substantially cylindrical members passing through respective aligned apertures in the side members, each having a crank-like portion at the end thereof, corresponding to the end of the driven cylindrical member having the crank-like portion, these members in combination with the driven cylindrical member defining a grilling surface for the placement of cylindrically shaped food items between adjacent cylindrical members and for the placement of flat sided food items on top of at least two adjacent cylindrical members;

(D) a drive member incorporating another plurality of apertures for rotatably receiving the crank-like portions of the driven cylindrical member and the other cylindrical members so that continuous rotational movement of the crank-like portion of the driven cylindrical member imparts similar continuous rotational movement in the crank-like portions of the remaining elongated members; and

(E) a hot plate positioned parallel to one of the elongated members having only one adjacent elongated member so that flat sided food items placed on the elongated members move across the grilling surface and are deposited on the hot plate;

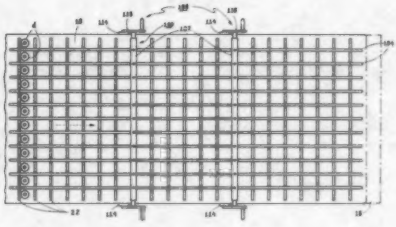
whereby rotation of the driven cylindrical member causes all of the interconnected remaining elongated members to turn in the same direction and with the same speed as the driven member so as to form a grilling surface with rotating members; and whereby cylindrically shaped food items such as frankfurters are automatically turned by the cylindrical members while flat sided food items such as hamburgers are moved across the grilling surface onto the hot plate.

4,370,921

DOUGHNUT FRYER GUIDE

George O. Moller, Dumont, and Richard L. Twiford, South River, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,324
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—405 **12 Claims**



1. A doughnut fryer guide for use in a doughnut frying machine having propelling means for advancing dough forms through a hot oil bath, said doughnut fryer guide comprising:

a plurality of guide bars secured together as a unit for limiting movement of a plurality of adjacent rows of advancing dough forms transverse to the direction of advance and maintaining said advancing dough forms in said plurality of rows when said guide bars are in an operative position; and

retracting means for moving said guide bars as a unit between said operative position and a retracted position in which said guide bars do not interfere with the movement of the dough forms.

4,370,922

NUTCRACKER

Ernest J. Rollband, 3415 Slaterville Rd., Brooktondale, N.Y. 14816

Filed Feb. 5, 1981, Ser. No. 231,897
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—572 **7 Claims**

1. A nutcracker, comprising:

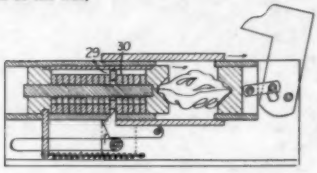
a. base means for supporting the nutcracker;

b. a receiver assembly mounted on the base means so as to be

slidable along at least part of the length of the base means, comprising

1. nut receiving means for holding an end of a nut to be cracked;
2. a plurality of disk elements, each having two parallel flat faces and a thin circumferential edge;
3. said disk elements being assembled with the flat faces of each disk element in slidable contact with a flat face of an adjoining element, such that the flat faces of each disk element can be made to slide along the flat faces of the adjoining disk elements;
4. the assembly of disk elements being normally in a coaxial arrangement with the circumferential edges in alignment;
5. said assembly of disk elements being attached to the nut receiving means for co-operative motion therewith;
6. means for sliding the receiver assembly along the base means;

c. piston means adapted for holding an end of the nut to be cracked, slidably mounted on the base means along the same axis of movement as the receiver assembly, such that the piston means and nut receiving means may hold opposite ends of the nut;



d. means for biasing the nut receiver assembly toward the piston means such that a nut inserted between the piston and nut receiving means is held firmly therebetween;

e. latching means attached to the base means for preventing slidable motion of the receiver assembly along the base means, holding said receiver assembly in its biased position against the nut, comprising

1. raising means for contacting the circumferential edge of at least one of the receiver assembly disk elements, and moving said element out of its normal co-axial alignment relative to the others by causing said disk element to move slidably along the flat faces of the adjoining disk elements;
2. said motion of at least one of the disk elements exposing at least part of one of the flat faces on at least one adjoining disk element;
3. locking means for contacting said exposed flat face, whereby the slidable motion of the receiver assembly along the base means is prevented;

f. means for slidably moving the piston means toward the nut receiving means, locked into place by the latching means, cracking the nut held therebetween.

4,370,923

APPARATUS FOR LEVELING THE SURFACE OF A STRIP OF PAPER

Sylvia Schmidt, Reutlingen, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 44,169, May 31, 1979, abandoned. This application Feb. 10, 1981, Ser. No. 233,063

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823738

Int. Cl.³ B30B *3/04, 15/26, 15/34*

U.S. Cl. 100—47 **10 Claims**

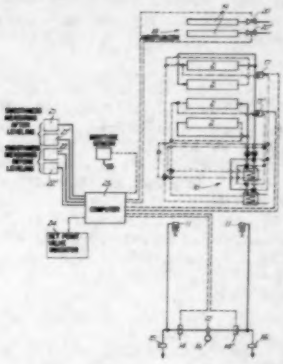
1. Apparatus for leveling the surface of a strip of paper, said apparatus having at least two rollers forming a roller pair for pressing against the strip of paper guided between them with an adjustable force by a load device, at least one roller of said roller pair having a surface influenced by a temperature device, said apparatus comprising:

actual value indicator means for producing an actual characteristic value signal representative of the smoothness of the surface of the strip of paper;

set point value indicator means for producing a set point value signal representative of the desired smoothness of the surface of the strip of paper;

means for producing a load signal representative of the force applied by said load device to said strip of paper;

temperature controlling means for changing the surface temperature of at least one of said two rollers to change the temperature of a surface of said strip of paper, said temperature controlling means including means for producing a temperature value signal representative of the temperature of a surface of said strip of paper;



computer means connected to receive said actual characteristic value, set point value, load and temperature value signals for calculating adjustment values for said load device and said temperature controlling means and for producing output load and output temperature controlling signals representative of the calculated adjustment values; and

said computer means also being connected to said load device and said temperature controlling means;

wherein said computer means transmits said output load and output temperature controlling signals to said load device and said temperature controlling means, respectively, for varying the force applied to the strip of paper and the temperature of a surface of said strip of paper in accordance with the calculated adjustment values, such that the surface of the strip of paper is leveled with a minimal amount of force applied to said strip of paper.

4,370,924

AGRICULTURAL BALERS

James A. Munro, Aylesbury, England, assignor to Sperry Corporation, New Holland, Pa.

Filed Jul. 28, 1980, Ser. No. 172,597

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—189 **4 Claims**

1. A baler comprising:

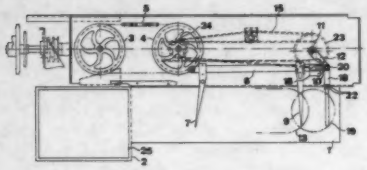
a feed area having first and second ends;

a bale chamber, said first end of said feed area being adjacent said bale chamber;

a pair of telescopically interconnected support members operably connected to said bailer for movement in loop-like paths, said support members sliding freely with respect to each other during movement in said loop-like paths;

a first one of said support members moving adjacent said first end of said feed area;

a second one of said support members moving adjacent said second end of said feed area;



a first feed finger directly connected to said first support member; and

a second feed finger directly connected to said second support member.

4,370,925

APPARATUS FOR MULTIPLE COLOR PRINTING

Ozawa Kazumi, Koga, and No Shinichiro, Hooya, both of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

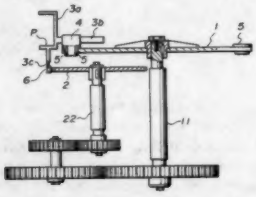
PCT No. PCT/JP80/00205, § 371 Date Apr. 13, 1981, § 102(e) Date Apr. 13, 1981, PCT Pub. No. WO81/00693, PCT Pub. Date Mar. 19, 1981

PCT Filed Sep. 10, 1980, Ser. No. 253,756

Claims priority, application Japan, Sep. 10, 1979, 54-115245

Int. Cl.³ B41F *17/20*

U.S. Cl. 101—40 **1 Claim**



1. A continuous multicolor printing apparatus for sequentially printing the surfaces of cylindrical articles which are successively fed and conveyed at a constant speed, comprising a conveyor unit adapted to convey said articles at a constant speed, said conveyor unit including a rotary disk having a plurality of bearings mounted on the outer periphery thereof and having a rotating shaft for rotating said disk, a conveyor chain arranged to be moved along a predetermined locus controlled by inner and outer guides, a plurality of support means each having a cradle for supporting an article to be printed, a plurality of rotary printing units disposed along the conveying locus of said articles, cradle rotating units for rotating said cradle to allow the articles to be brought into rolling contact with said printing units, a feeding unit for supplying the articles to the conveyor and a delivery unit for delivering printed articles from the apparatus, said support means including an arm, a frame for holding said article to be printed and a connecting member, a freely rotatable shaft mounted on each one of said bearings, said arm of said support means being arranged to be slidably fitted into each respective rotatable shaft, said connecting member being connected through a linkage with said conveyor chain, a sprocket having a further shaft driven by a prime mover and adapted to drive said conveyor chain, said rotating shaft of said rotary disk being arranged to rotate synchronously with said rotating shaft of said sprocket, said cradle rotating units each including a cradle rotating sprocket adapted to rotate said cradle, a fixed plate having a configuration similar to that of said conveying locus and a fixed chain stretching around a major part of the outer periphery of said fixed plate, said sprocket engaging said fixed chain so as to be moved therealong.

4,370,926

PRINTING PRESS FOR PRINTING SHEETS OF CORRUGATED PAPERBOARD

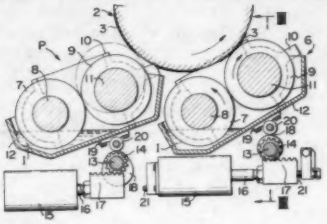
Fukutaro Hattori, Kasugai, Japan, assignor to Isowa Industry Co., Ltd., Nagoya, Japan

Filed Jan. 30, 1981, Ser. No. 229,997

Claims priority, application Japan, Feb. 2, 1980, 55-11701

Int. Cl.³ B41F *1/46, 31/06*

U.S. Cl. 101—207 **4 Claims**



1. An inking device for a rotary printing press having a plate cylinder and a pressing cylinder cooperating with the plate cylinder, particularly for printing sheets of corrugated paperboard, comprising:

at least two inking arrangements disposed to be movable relative to said plate cylinder, each of said inking arrangements including an ink fountain containing ink and an ink fountain roller partially immersed in the ink; and

means for moving one of said inking arrangements into an ink transferring relationship with respect to said plate cylinder and for moving the other inking arrangement out of ink transferring relationship, each of said inking arrangements being moved solely by pivoting about an axis, the pivotal axes of the inking arrangements being parallel to and spaced from each other each of said inking arrangements comprising a form roller carried by the inking arrangement in contact with said ink fountain roller.

4,370,927

PAPER WEB THREADING APPARATUS FOR ROTARY PRINTING MACHINES

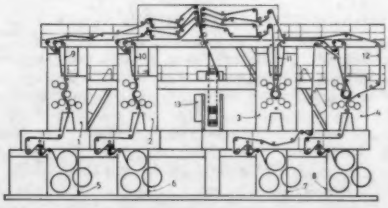
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 21, 1981, Ser. No. 256,133

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 8011068

Int. Cl.³ B41F *13/02*

U.S. Cl. 101—228 **15 Claims**



1. Web threading apparatus for a rotary printing machine to

thread a web of material for printing thereon in a predetermined threading path through the machine, comprising

a tubular threading guide (15) of essentially circular cross section including a plurality of threading guide tube sections (44, 43; 52, 53, 64, 65) positioned on the machine in accordance with said path;

an elongated flexible threading element (14) positioned in said tube sections, the threading element having a cross-sectional shape which has the characteristic that the resistance against bending of the element in any direction with respect to the longitudinal extent thereof is at least approximately equal;

the threading guide tube sections being sequentially positioned in accordance with said path, the tube sections being formed with a slit (17) therein;

a pulling hook (16) secured to the threading guide element (14) and extending through said slit in the tube sections;

and at least one friction drive station positioned between adjacent tube sections comprising

a plurality of friction drive wheels (48, 49, 50) engaging said flexible threading element, a first one of said friction drive wheels (50) engaging the flexible element (14) from one lateral side, and two friction drive wheels (48, 49) engaging the flexible threading element from the other side and positioned with respect to said first frictional drive wheel to press the flexible threading element against said first frictional drive wheel over a predetermined angular arc position thereof,

the end positions of the tube section adjacent said drive wheel being directed essentially tangentially towards the two drive wheels to provide for positive feed and positioning of the threading element within the tube sections and guidance in the zone between said wheels.

4,370,928

SHEET FED ROTARY PRESS HAVING AN AUXILIARY GRIPPER SYSTEM ARRANGED BELOW A FEEDING CYLINDER

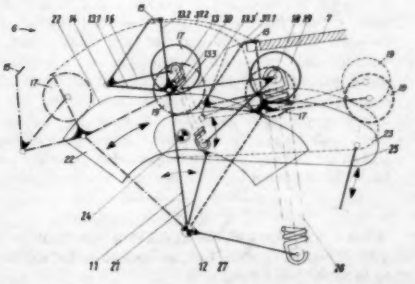
Günter Weisbach, Radebeul; Günter Lucius, Dresden, and Dieter Plage, Coswig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 135,627, Mar. 31, 1980. This application May 29, 1980, Ser. No. 154,303

Claims priority, application German Democratic Rep., Feb. 4, 1979, 211938

Int. Cl.³ B41F *21/05;* B65H *5/10, 5/14*

U.S. Cl. 101—242 **6 Claims**



1. A sheet fed rotary press comprising at least one set of printing cylinders; a feed cylinder cooperating with said one set; a sheet fed table having an outlet part arranged below said feed cylinder and extending in a plane which is spaced apart and directed away from the periphery of said feed cylinder; a rocking auxiliary gripper system arranged below the feed cylinder for gripping sheets from said outlet part and transferring sheets upwardly toward said feed cylinder; said auxiliary gripper system including a first control cam and a second control cam, a driving rocker arm, a three-armed lever pivotably supported on the rocker arm, an auxiliary gripper having a lip pivotably mounted on a first arm of the lever and a stop formed at the free end of a second arm of the lever, a first cam follower cooperating with the first control cam and being connected to said lip to control the movement of the latter, and a second cam follower rotatably supported on the third arm of the lever and cooperating with the second control cam.

4,370,929

CONTACT HEAD

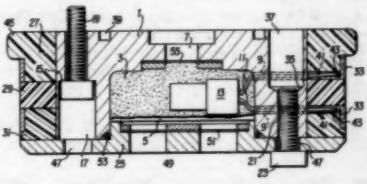
Wolfgang Steinicke, Olympiaring 43; Wolfgang Badura, Maerzfeld 8; Alois Schiessl, Hochfeldstrasse 26; Werner Weinzierl, Schillerstrasse 36a, all of D-8230 Bad Reichenhall, and Hartmut Krone, Gaihofstrasse 13, D-7841 Auggen, all of Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 175,024

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1979, 2932921

Int. Cl.³ F42C *19/12;* F42B *9/08*

U.S. Cl. 102—202 **9 Claims**



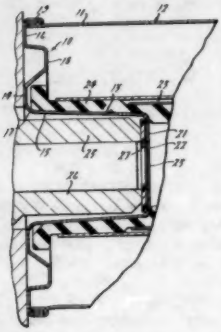
1. A contact head for a projectile which is capable of being fired from an electrically actuable launcher, said head comprising a solid metal core formed on one side with a recess constituting a propellent charge chamber, formed with a central bore leading to said recess for reception of an ignition charge unit, formed with substantially radially extending bores leading into said recess for the reception of firing circuit wires, formed in the part surrounding said recess with a first set of bores having an internal shoulder substantially in the centre of the thickness of said part for receiving connecting screws for attaching the contact head to a container of said projectile, and formed also in the part surrounding said recess with a second set of threaded bores for receiving the threaded shanks of fixing screws, said bores of said first and second sets alternating at substantially equal angles about the longitudinal axis of said core; a propellent charge located in said propellent charge chamber; a primer capsule disposed in said propellent charge; an elastic protective ring member coaxially surrounding said core; first and second contact rings carried by said protective ring member; fixing circuit wires connecting said first and second contact rings and said primer capsule; a base plate secured to said one side of the core so as tightly to seal off at least said propellent charge chamber, the base plate being formed with bores corresponding with and adapted to register with the bores of the first and second sets formed in the part of the core surrounding said recess, and having breakage points for the egress of gases upon ignition of said propellent charge; connecting screws received in said bores of said first set of bores; and fixing screws fixing said base plate to the core and threadedly engaging in the bores of the second set of bores.

4,370,930

END CAP FOR A PROPELLANT CONTAINER

Robert A. Strasser, Livonia, and Stephen W. Goch, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 29, 1980, Ser. No. 220,478
Int. Cl.³ F42B 5/20, 9/18
U.S. Cl. 102—530 4 Claims



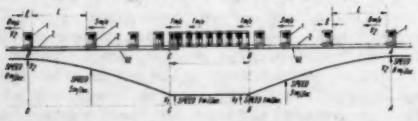
1. An end cap adapted to fit on one end of a tubular container for propellant material,
the end cap comprising a deep drawn cup adapted to receive a propellant igniter means,
the outer width dimension of the cup being less than the inner width dimension of the container,
the cup having a flange engirding one of its ends,
the cup being inserted into the propellant container to a depth permitted by the flange abutting a peripheral edge of the container,
the excess material of the flange being rolled and crimped over the container peripheral edge for retention of the cup within the container,
the cup having at its end opposite the flanged end a base wall having a centrally located aperture through which a signal from an igniter means is passable to ignite the propellant in the container,
the aperture normally being sealed by a composite laminate of plastic film and metal foil that is rupturable upon occurrence of the igniter means signal,
and a plastic annulus interposed between the igniter means and the laminate to protect the latter against frictional erosion by the igniter means by environmental vibrations transmitted to the propellant container.

4,370,931

TRANSPORTATION SYSTEM UTILIZING A STRETCHABLE TRAIN OF CARS AND STRETCHABLE BANDCONVEYORS

Axel de Broqueville, 2717 Stanford St., Dallas, Tex. 75225

Continuation-in-part of Ser. No. 19,776, Mar. 12, 1979, abandoned. This application Mar. 6, 1980, Ser. No. 127,541
Int. Cl.³ A63G 1/00
U.S. Cl. 104—20 20 Claims



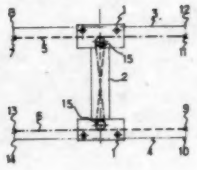
14. A transportation device comprising:
a plurality of successive load carrying components,
means for moving said components along a closed loop path,
means for controlling the speed of said components and their distance apart, said controlling means operable by moving said components along said closed loop path without rotation of said components traversed to said closed-loop path, and said controlling means comprises:
threaded rods and nuts associated therewith;
means for attaching at least one of said moving components to one end of at least one threaded rod and the next component to at least one nut associated therewith; and
means for rotating said nuts for increasing and decreasing the distance between consecutive components.

4,370,932

APPARATUS FOR THE INTERCONNECTION OF TWO MOBILE CARRIERS GUIDED BY PARALLEL RAILS

Jean Etcheparre, and Bernard Etcheparre, both of Merignac, France, assignors to Lectra Systemes S.A., Pont de la Maye, France

Filed Sep. 22, 1980, Ser. No. 189,813
Claims priority, application France, Sep. 26, 1979, 79 24459
Int. Cl.³ B66C 13/18
U.S. Cl. 105—163 SK 2 Claims



1. Apparatus interconnecting two mobile carriages which are connected by a rigid beam guided by and along parallel guide rails, said apparatus comprising:
(a) first and second cables interconnecting said carriages to said parallel guide rails, one end of each of said cables being attached to an end of a respective one of said guide rails and the other end of each of said cables being attached to a generally diagonally opposed end of the other, parallel guide rail;
(b) a single return pulley fixedly associated with each of said carriages, said carriages supporting portions of said cables intermediate the ends of both of said cables, each of said cables being supported along an exterior peripheral portion of the pulleys, as viewed with respect to the attachment ends of said cables to said rails, each of said cables thereby describing a generally Z-shaped configuration between said one cable end and said other cable end, whereby the configurations of the cables are symmetric, the displacement of either one of said carriages alone placing a respective one of said cables under tension, thereby imposing an identical and simultaneous displacement, with respect both to direction and distance, upon said other carriage, said carriages being generally maintained in alignment by the other, non-tensioned cable.

4,370,933

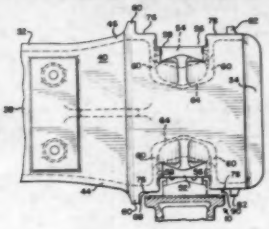
RAILWAY CAR TRUCK BOLSTER ASSEMBLY

Harry W. Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 6, 1981, Ser. No. 251,398
Int. Cl.³ B61F 5/06, 5/12, 5/50
U.S. Cl. 105—197 DB 1 Claim

1. A railroad truck assembly comprising a pair of laterally spaced side frames, a bolster transversely positioned between said side frames with end portions resiliently supported in windows formed in said side frames, each said bolster end portion formed with a pair of longitudinally spaced, in the longitudinal direction of the truck, shoe pockets, each receiv-

ing a friction shoe to engage with vertical sidewalls defining said windows, the improvement comprising, a wear liner means disposed on each said sidewall and having its lateral edges extending beyond a width of said friction shoe, an inner and outer set of vertical lands formed as part of said bolster end portions on each lateral side of said shoe pockets such that a



longitudinal space between said inner lands and said wear liner means is less than a longitudinal space between said outer lands and said wear liner means, so that during relative movements between said bolster and said side frames, contact therebetween is limited to said bolster inner lands and said wear liner means of said side frames.

4,370,934

METHOD FOR PRODUCTION OF A COMPRESSION-PROOF SHELTER AND PREFABRICATED MEANS FOR USE IN THIS METHOD

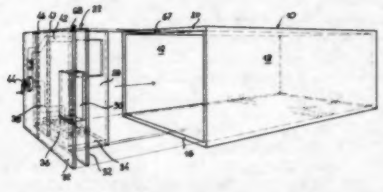
Wilhelm Hünssler, Residenzplatz 1, D-8960 Kempten, Fed. Rep. of Germany

Filed Jan. 12, 1981, Ser. No. 224,026

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3003988; Oct. 18, 1980, 3039465

Int. Cl.³ E04H 9/04

U.S. Cl. 109—1 S **13 Claims**



1. A method for producing a shelter in the form of an oblong prismatic housing having at least one compression-proof cross wall of a large thickness within the housing partitioning off a person chamber from an air filtering chamber and/or an emergency exit chamber, the method comprising the steps: Providing at least one opening in that portion of the ceiling of a light-weight housing and/or at least one longitudinal wall adjacent said ceiling corresponding to the position of the cross wall; arranging a dead or lost cross shuttering means consisting of a pair of thin walls within said housing, connection means mounted or mounting at the shuttering means and extending from one side of which to the other side, said connection means at least comprising spacer elements, ventilation conduit means and a passage or corridor box; transporting the housing from the working place to the place of use before or after having arranged the shuttering means; pouring concrete through the opening into the shuttering means and thereby forming a compression-proof cross wall at the place of use of the shelter; and using the housing as an inner shuttering when forming a compression-proof cover by surrounding walls of reinforced concrete.

4,370,935

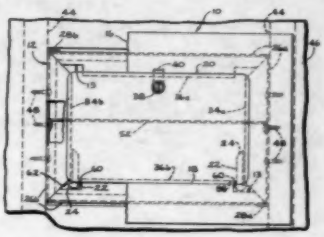
WALL SAFE AND DOOR HINGING MEANS THEREFOR

Lawrence R. Link, 3105 Tremont Dr., Louisville, Ky. 40205

Filed Jul. 14, 1980, Ser. No. 167,833

Int. Cl.³ E05G 1/04

U.S. Cl. 109—51 **13 Claims**



1. A wall safe comprising

a rectangular box defining a storage chamber and an access opening in a front surface of said box communicating with said chamber, said box being adapted to fit relatively closely between adjacent vertical wall studs of a building,

fastening means for securing the vertical sides of said box to said wall studs,

a rectangularly shaped face plate attached to said front surface and defining a door opening therein disposed in registry with said access opening, said face plate having boltless edge portions which extend beyond said box sides across at least a major portion of the front surface of said wall studs,

a door hingably connected to said box for closing in close fitting relation to said door and for opening into a horizontal position in front of the lower margin of said door opening to form an article supporting platform, and

a pair of L-shaped hinges fixedly attached along one leg portion thereof to a lower corner portion of said door, the other laterally projecting leg portions thereof extending beyond the lower edge of said door behind said face plate and against a wall defining a front surface of said chamber when said door is closed in said door opening, said laterally projecting leg portions extending behind and against vertical edge portions of the access opening defining front wall of said box to thus support said door in a horizontal position when said door is open to form said platform.

4,370,936

FABRIC TUBE FORMING METHODS AND APPARATUS

James D. Moyer, and Robert S. Hoffert, both of Winchester, Va., assignors to Midwestco, Inc., Niles, Ill.

Filed Oct. 18, 1979, Ser. No. 86,141

Int. Cl.³ D05B 13/00

U.S. Cl. 112—10 **13 Claims**

1. Apparatus for forming a tubular fabric bag with ends square to the length of the bag comprising:

means for feeding a flat sheet of fabric material along an extended path of travel,

means for stopping the feeding of said sheet,

means for cutting said sheet along a substantial portion of its width on a line that is spaced inwardly of each edge of the sheet,

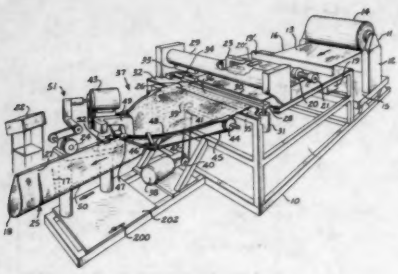
means for resuming feeding of the sheet along said path,

means downstream of the cutting means for folding the edges of the sheet into a seam with the cut line precisely aligned on opposite sides of the seam so that the bag after its seam is sewn can be separated by snipping through the seam to provide a bag with precisely square ends, and

means for sewing the seam.

11. Apparatus for automatically forming a filter bag tube comprising

means for frictionally gripping each side edge of a flat sheet of fabric material,
means for moving the gripping means toward each other to move the edges toward each other,



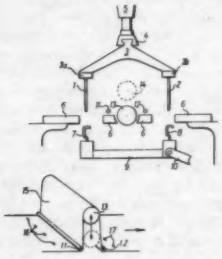
means for engaging said edges in predetermined alignment with each other and
means for sewing said edges together.

4,370,937

TUFTING MACHINES

Jon P. M. Denny, 9 Grange Dr., Emley, Huddersfield, England (HD8 9SF)

Filed Aug. 1, 1980, Ser. No. 174,665
Claims priority, application United Kingdom, Aug. 3, 1979, 7927222
Int. Cl.³ D05C *15/26*
U.S. Cl. 112—79 A **9 Claims**



1. A tufting machine for operating on an elongate workpiece web displaced lengthwise through the machine, comprising a pair of needle bars, a respective row of needles carried by each needle bar, means mounting said two rows of needles transversely in relation to the direction of workpiece movement with a space between the two rows in said direction of movement, a device mounted in said space between the two rows of needles and adapted to engage the workpiece web and means for adjusting said device to enable the length of said workpiece web disposed between the two rows of needles to be selectively increased or decreased.

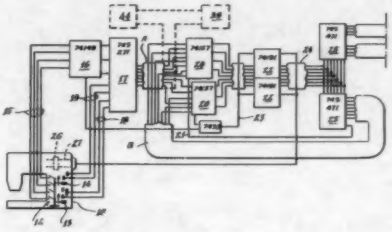
9. A tufting machine for operating on an elongate workpiece web displaceable lengthwise through the machine, comprising a pair of needle bars, a respective row of needles carried by each needle bar, means mounting said two rows of needles transversely in relation to the direction of workpiece movement with a space between the two rows in said direction of movement, a non-rotatable bar in said space between the two rows of needles and adapted to engage the workpiece web, and means adjustably mounting said non-rotatable bar to adjust selectively the warpwise length of said workpiece web disposed between the two rows of needles.

4,370,938

ELECTRONIC SEWING MACHINE WITH STITCH CONTROL DEPENDENT ON SEWING MATERIAL

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Dec. 16, 1980, Ser. No. 216,929
Claims priority, application Sweden, Dec. 11, 1979, 7910201
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **7 Claims**



1. In a sewing machine having a needle positioning mechanism, a cloth feeder, input means adapted to be adjusted by an operator, means for controlling the needle positioning mechanism to provide transverse movement of a needle and for controlling movements of the cloth feeder for providing determined seam patterns on a sewing material, and a memory unit connected to control said controlling means as a function of adjustments on said input means; the improvement wherein said input means comprises means for producing address signals in accordance with the setting thereof, means applying said address signals to said memory unit whereby said memory unit produces output signals in accordance with pre-programmed data therein for controlling said controlling means in accordance therewith, and further means for stepping the address signal output of said input means in dependence upon the completion of operations of said controlling means, the data stored in said memory unit including data relating to the empirically best stitch characteristics for different thicknesses and textures of said sewing material, whereby said input means may be set in accordance with said thickness and texture for the automatic adjustment of said seam.

4,370,939

METHOD AND MECHANISM FOR INSERTING AN ELASTIC BAND IN SELECTED AREAS OF MATTRESS-WRAPPING BEDCLOTHES

Francisco Carreras Fontcuberta, Caldas de Montbuy, Spain, assignor to Bassetti S.p.A., Milan, Italy

Filed Dec. 9, 1980, Ser. No. 214,866
Claims priority, application Spain, Dec. 12, 1979, 486826; Italy, Sep. 10, 1980, 24573 A/80
Int. Cl.³ D05B *21/00, 97/00*
U.S. Cl. 112—262.2 **11 Claims**

1. A method for inserting an elastic band in selected angular areas of a mattress-wrapping bed sheet, comprising the steps of:

1. sensing the sewing seam uniting edgewise one of the four lateral flaps of said mattress-enveloping bed sheet;
2. signalling the sensing of such sewing seam to a stitch-counting assembly of a sewing machine in which a preselected number of stitches has been preset, corresponding to the length of said angular areas to be elasticized;
3. detecting the correct position of the bed sheet relative to the selected sewing line and guiding the bed sheet therealong causing the bed sheet portion not directly engaged by the folding and sewing operation vertically and freely to hang down;
4. folding the sheet edge at a position ahead of the sewing zone

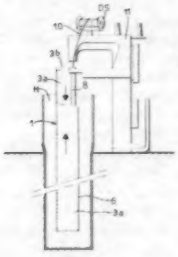
to form a sheath intended to house an elastic band therewithin;

5. introducing the leading edge of a pretensioned elastic band into the sheath formed by the doubled edge of said bed sheet and starting the operation of the sewing needle of the machine to sew said elastic band and said doubled bed sheet edge together;
6. continuing the feed of elastic band and the sewing thereof along a sewing path length corresponding to said predetermined number of stitches;
7. moving said elastic band away of said sewing line and impressing a twist to the unsewn portion thereof;
8. snipping said elastic band twisted portion perpendicularly;
9. continuing the edge-folding operation and the sewing operation without the elastic band being present until the next following lateral-flap sewing seam is sensed;
10. resuming all the sequence of steps from 1 to 9 hereof until all the four angular areas of said mattress-enveloping sheet have been elasticized by respective segments of said elastic band;
11. finishing the sewing of the remaining non-elasticized zone of said bed sheet doubled edge, and
12. removing the finished textile article from the sewing area.

2. A sewing machine, comprising, in combination:

(a) an industrial sewing machine having a needle, a needle-bar, a needle-bar reciprocating mechanism, a needle plate, a shuttle, a presser foot and a fabric-feeding mechanism;

(b) a fixed member for supporting the fabric to be fitted with an



elastic band and for guiding it towards the sewing area of said sewing machine;

(c) a free vertical space beneath said fabric-supporting fixed member to have the portion of the fabric which is not engaged by the sewing machine freely and vertically depending;

(d) means for pressing the fabric entering the device against said fixed supporting member under the control of at least one device capable of sensing the position of the fabric edge;

(e) a thickness gauge for sensing the thickness of the transversal angular seams of said bed sheet;

(f) a fabric-edge-shaping and doubling device placed immediately downstream of said fabric-pressing means and said position-sensing device(s) for folding down the edge of said bed sheet fabric;

(g) an elastic band dispensing spool placed above said sewing machine;

(h) a mechanism for leading the elastic band towards the folded down fabric edge, for maintaining said elastic band in the space provided by said folded down fabric edge until said edge and said elastic band are sewn together, and for withdrawing said elastic band away of the sewing area of said sewing machine and of said folded fabric edge while concurrently impressing a twist to the unsewn portion of said elastic band;

(i) a braking device for tensioning said elastic band;

(j) a snipping mechanism essentially consisting of a snipping blade reciprocable on a vertical plane and housed in a specially provided space of the presser foot of said sewing machine;

(k) a stitch-counting assembly associated to a rotatable component part of said sewing-machine, and

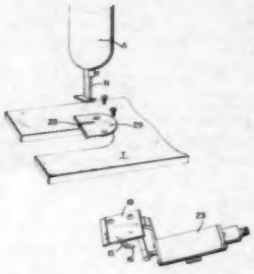
(l) means actuable by said thickness gauge for starting the operation of the sewing machine and having it continued for a time as determined by said stitch-counting mechanism.

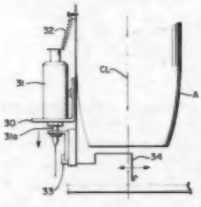
4,370,940

AUTOMATIC THREAD TRIMMER FOR COMPUTERIZED ZIGZAG EMBROIDERY SEWING MACHINE

Zecharia Melzer, and John E. Rice, Sr., both of Louisville, Ky., assignors to Louisville Manufacturing Co., Inc., Louisville, Ky.

Filed Mar. 12, 1981, Ser. No. 242,906
Int. Cl.³ D05B 65/00
U.S. Cl. 112—286 **8 Claims**





1. An automatic thread trimmer for use on a computerized embroidery sewing machine having a work table, a bobbin mechanism below said work table, an arm overhanging the work table with a needle driving means therein movable through one cycle for each cycle of operation of the sewing machine needle, and computerized control means connected to said machine for driving the needle driving means and shifting the needle according to the computer program, said thread trimmer comprising:

a thread catching member positioned below said work table and reciprocally movable across the path of a thread extending through said work table to the bobbin means for catching the thread at the end of the movement in one direction and drawing the thread with said thread catching member during movement in the other direction;

cutting means adjacent the path of movement of said thread catching means against which the thread catching means draws the thread for cutting the thread during movement in the other direction;

driving means connected to said thread catching member for driving said thread catching member in reciprocating movement;

wiper means positioned above said work table and having a

wiper reciprocally movable across the path of the thread for removing the thread after it has been cut by said cutting means;

wiper actuating means connected to said wiper for driving said wiper in reciprocating movement;

signal producing means associatd with the needle driving means for producing first and second signals, the first when said needle driving means is at a position in the cycle of operation of the needle where the needle is raised clear of the path of reciprocation of said thread catching member, and the second when the needle is raised clear of the path of reciprocation of said wiper; and

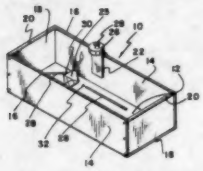
control means connected to said signal producing means and to said driving means and said wiper actuating means for receiving said signals from said signal producing means and discriminating when the signals are only in the order of said first signal and said second signal and thereupon actuating said driving means and said wiper actuating means in sequence.

4,370,941

APPARATUS FOR BATIKING EGGS AND THE LIKE

Betty R. Belton, 1007 N. Grand, Ellsworth, Kans. 67439

Filed Mar. 23, 1981, Ser. No. 246,645
Int. Cl.³ B05C *17/10*
U.S. Cl. 118—13 **3 Claims**



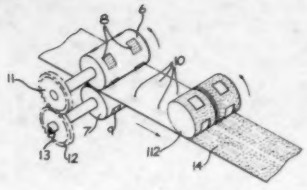
1. An apparatus for batiking eggs, articles, or the like, comprising an open top container means including a plurality of walls; a receptacle means for holding a wax means; a clamp means slidably, removably lodging over an edge of one of said walls and including said receptacle means secured thereto; burner means for positioning under said receptacle means for melting said wax means into a molten state; and wax teardropping means for dipping by the user of said batiking apparatus into said molten wax means in order to designly deposit said molten wax means onto said egg, article, or the like, while the batik apparatus user's hand holding said teardropping means rests on an edge of one of the walls and the remaining user's hand holds the egg, article, or the like, in the process of decorating the same; a lid means for removably positioning over said receptacle means in the event of kindling of said wax means within said receptacle means while being heated into a molten state by said burner means, said lid means including a wooden knob means secured thereto for grasping by the batik apparatus user in removing the lid means from the receptacle means; said clamp means comprises a structure defining a U-shape, said U-shaped clamp being inverted to slidably lodge over and along an edge of one of the walls; said receptacle means is defined by a cylindrical cup having a bottom affixed to said inverted U-shaped clamp; and said open top container means comprises a generally rectangular box having a pair of opposed end walls and a pair of opposed side walls, said inverted U-shaped clamp having said cylindrical cup secured thereto slidably lodges on and along one of said pair of opposed side walls.

4,370,942

PERFORATION OF WEB MATERIAL, ESPECIALLY UNITING PAPER FOR MAKING VENTILATED FILTER CIGARETTES

John G. Dowding, and Edward G. Preston, both of London, England, assignors to Molins Limited, London, England

Filed Aug. 1, 1980, Ser. No. 174,506
Claims priority, application United Kingdom, Aug. 2, 1979, 7927004; Apr. 10, 1980, 8011879; Apr. 14, 1980, 8012189
Int. Cl.³ B05C *1/16*
U.S. Cl. 118—40 **6 Claims**



1. A filter attachment machine including means for perforating the uniting paper which is used to secure a filter to a cigarette, comprising a perforating roller having groups of pins at circumferentially-spaced positions, means including a backing roller for moving a band of uniting paper in contact with said perforating roller to perforate areas of the paper with said groups of pins, and drive means for driving both the perforating roller and the backing roller with a predetermined timing so that the peripheral speed of the backing roller exactly equals that of the perforating roller, said backing roller having a permanently-deformable surface formed with indentations exactly corresponding to the positions of the pins carried by said perforating roller, the deformable material forming the surface of the backing roller being such that the indentations are permanently formed by the pins when the rollers are first operated and the relative sizes of said perforating roller and said backing roller are such that, during each successive rotation of said rollers, each pin exactly enters the same indentations in said backing roller which it originally formed therein, whereby gaps are formed between the areas perforated by the pins which coincide with positions at which the uniting paper is to be laterally cut to produce individual portions for wrapping around corresponding cigarette and filter assemblies, each group of pins comprising a plurality of circumferentially-extending rows of substantially-equal length ending at each end near the cutting position, said groups being spaced so as to leave said gaps in the form of unperforated areas extending across the paper and of a width greater than the distance between adjacent pins in a group.

3. A filter attachment machine according to claim 1, and further including a cutting device which is arranged to cut the paper web along transverse lines lying between the perforated areas of the paper.

4. A filter attachment machine according to claim 3, including means for applying adhesive to the uniting paper along edge portions of the paper and laterally along areas lying between the perforated areas.

4,370,943

APPARATUS FOR PAINTING CONTAINERS

Kazutomi Watanabe; Sokichi Iwasaki, and Nobuyuki Baba, all of Sakai, Japan, assignors to Shin Nippon Koki Co., Ltd., Osaka, Japan

Filed Dec. 19, 1980, Ser. No. 218,192
Claims priority, application Japan, Dec. 22, 1979, 54-166297
Int. Cl.³ B05C *1/00*
U.S. Cl. 118—218 **11 Claims**

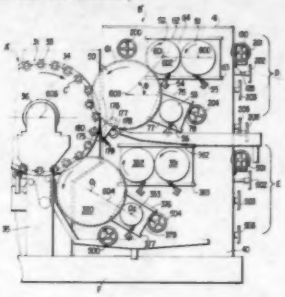
1. Apparatus for painting the outer circumferential surfaces of a plurality of cylindrical containers, comprising

a rotatable disc having a surface positioned in a vertical plane, said rotatable disc being rotatable about an axis lying in a horizontal plane;

a plurality of equally spaced rotatable mandrels secured to the surface of said disc along a concentric circle adjacent the periphery thereof and projecting horizontally therefrom, each of said mandrels following a predetermined path and being adapted to releasably support a cylindrical container;

a rotatable painting roll having a horizontal axis of rotation displaced vertically from said horizontal plane and positioned adjacent said disc, said painting roll being urged into close contact with the containers supported on said mandrels for painting said containers as said mandrels traverse said predetermined travel path;

a first rotatable paint storage roll, including a shaft, having a horizontal axis of rotation;



a second rotatable paint storage roll having a horizontal axis of rotation located above the horizontal axis of rotation of said painting roll, said second paint storage roll being interposed between said painting roll and said first paint storage roll, the axes of rotation of said first and second paint storage rolls being parallel and defining a horizontal plane, and the axis of rotation of said painting roll and said second paint storage roll being parallel and defining a plane which is angularly displaced with respect to said horizontal and vertical planes;

a second rotatable painting roll positioned in the direction of rotation of said disc from said first rotatable painting roll; and

means for displacing the predetermined path of said mandrels away from said second painting roll in the region between said first and second painting rolls.

4,370,944

APPARATUS FOR COATING THE INNER SURFACE OF LONG TUBES OF SMALL DIAMETER

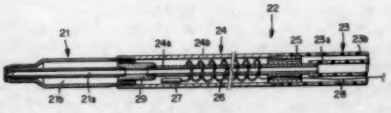
Koji Nagata; Mamoru Nishikawa, and Shiro Sato, all of Nagoya, Japan, assignors to Sumitomo Light Metal Ind., Ltd., Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,682

Claims priority, application Japan, May 14, 1980, 55-63681

Int. Cl.³ B05B *3/18, 7/22*

U.S. Cl. 118—302 **12 Claims**



1. A coating apparatus for coating the inner surface of a long tube of small diameter by spraying a paint in atomization while being shifted from one end opening to the other end opening thereof comprising:

a supplying hose which is longer than said long tube for being inserted into and drawn back from said long tube and provided therein with respective passage for supplying a paint and compressed air;

a spray nozzle attached to the tip of said supplying hose for spraying the paint in atomization supplied from outside of said long tube; and

heating means disposed at least in the neighborhood of the attaching portion of said nozzle to said supplying hose for heating the paint and the compressed air to a predetermined temperature.

4,370,945

METHOD FOR GLUING OF PARTICLES CONTAINING CHIPS, FIBERS AND SIMILAR LIGNO-CELLULOSE-CONTAINING PARTICLES AND APPARATUS FOR THIS PURPOSE OF GLUING THE SAME

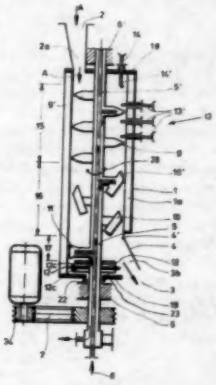
Heinrich Beckschulte, Salzkotten-Scharmede, and Wilhelm Schlüter, Altenbeken-Schwaney, both of Fed. Rep. of Germany, assignors to Gebrüder Lödige Maschinenbau Gesellschaft mit beschränkter Haftung, Paderborn, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,816

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016061

Int. Cl.³ G01D *13/22*

U.S. Cl. 118—303 **24 Claims**



1. A gluing machine for application of glue on chips, fibers and similar ligno-cellulose-containing particles which are discharged falling free into an at least substantially vertical chute having a circular shaped cross section, as well as having an upper chip inlet and a chip outlet located therebelow and also including means for supply of glue and having rotating tools influencing the movement of the chips, comprising a drum-shaped chute means, a shaft rotating at relatively high speed passing through said chute means, outwardly projecting tool means on said shaft for imparting centrifugal forces on the free falling chip material exiting the upper inlet to form a rotating chip material ring that accumulates or deposits on the inner wall of the vertical chute and moves downwardly in a helical or spiral manner, brake tools also arranged on said shaft for transmitting upwardly directed components of movement instrumental in stopping the downward free-falling movement of the chips, the chip inlet providing a directional component parallel to the rotational axis of the shaft and the chip outlet being arranged at a lower end of the chute means, and means for feeding glue after the at least substantial formation of the

chip material ring and prior to subjecting the chips to the brake tools.

4,370,946

METHOD FOR CONDITIONING AND PRESERVING EGGS OF INSECT OOPHAGE PARASITES OR PROCESS FOR CONDITIONING AND PRESERVATION OF EGGS OF OOPHAGOUS PARASITES OF INSECTS

Jean D. Voegele; Pierre E. J. Jourdheuil, both of Antibes; Jeannine M. Pizzol nee Dalmasso, Parc des Mimosas, and Bernard C. J. Pintureau, Antibes, all of France, assignors to Institut National de la Recherche Agronomique - UNRA, Paris, France

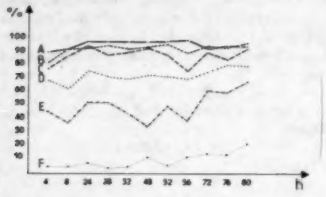
PCT No. PCT/FR80/00114, § 371 Date Mar. 6, 1981, § 102(e) Date Mar. 6, 1981, PCT Pub. No. WO81/00037, PCT Pub. Date Jan. 22, 1981

PCT Filed Jul. 7, 1980, Ser. No. 243,962

Claims priority, application France, Jul. 9, 1979, 79 17774

Int. Cl.³ A01K *67/00*

U.S. Cl. 119—1 **8 Claims**



1. Method of conditioning and preserving insect oophage parasites eggs, intended notably for biological control of certain plant pests, including parasitage of an egg-host and preservation in the cold, said method comprising the steps of:

starting with Lepidoptera eggs of foodstuffs, in particular of *Ephestia kuhniella,* parasitizing these eggs with adult Trichogramma, subjecting the thus parasitized eggs to an incubation period of at least 24 h at 20° C., with a photoperiod of 8 h light and 16 h darkness and a relative humidity of 70 to 80%, subjecting the thus incubated eggs to an induction period of about 6 to 80 days, at a temperature below 15° C. with a photoperiod of 8 h light and 16 h darkness, and a relative humidity of about 70%, then preserving the eggs thus obtained at 3° C., with a photoperiod of 8 h light and 16 h darkness and at a relative humidity of 70 to 80%.

4,370,947

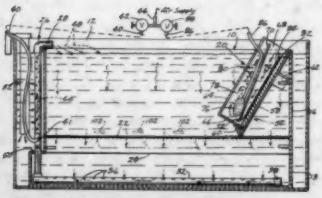
TROPICAL FISH EGG INCUBATOR

Mark A. Hilken, 709 E. 9th St., Spencer, Iowa 51301

Filed Apr. 13, 1981, Ser. No. 253,896

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—3 **21 Claims**



1. A fish egg incubator comprising, a water tank,

an enclosure positioned upright in said water tank for a continuous exchange of water between said tank and said enclosure, said enclosure having an open top end and a closed lower end wall and front and back walls,

a fish egg plate in said enclosure and on said back wall, said enclosure positioned in said tank with its open top end submerged in the water to provide fresh water into said other chamber to flow across said egg plate,

a dividing wall in said enclosure extending lengthwise thereof to define oppositely disposed chambers interconnected at the lower of said enclosure by said dividing wall being spaced from the lower end wall, and

an air stone in one of said chambers adjacent said front wall for causing water circulation downwardly in said other chamber across the egg plate and upwardly in said one chamber.

4,370,948

NIPPLE WATERER

Robert C. Atkins, 4548 Eisenhower Ave., Alexandria, Va. 22304

Filed Mar. 31, 1980, Ser. No. 135,547

Int. Cl.³ A01K *7/00*

U.S. Cl. 119—72.5 **5 Claims**

1. A nipple waterer comprising, a sleeve having an inlet end and an outlet end, a valve seat mounted in said sleeve intermediate the inlet and outlet ends, a valve head positioned on the inlet side of said seat, a stem integrally connected to said valve head and extending axially through said valve seat in a direction toward the outlet end of said sleeve, adjustable orifice means mounted in the inlet end of said sleeve; said adjustable orifice means comprising a first circular plate having an orifice therein, a second circular plate having an orifice therein, said plates being mounted in face-to-face relationship, said orifices being in communicating relationship to form an aperture therebetween, and means at the peripheral regions of said plates and extending therebetween for releasably holding the plates in an adjusted, angular relationship, whereby the size of the aperture may be varied, and a spring positioned between said adjustable orifice means and said valve head for biasing the valve head to the closed position against said seat.

4,370,949

WASTE HEAT RECOVERY SYSTEM

Ardell Beckett, 307 Moore Dr., R.R. #1, Ridgeville, Ontario, Canada (L0S 1M0)

Filed Feb. 8, 1980, Ser. No. 119,725

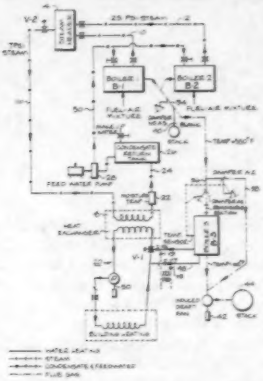
Claims priority, application Canada, Nov. 21, 1979, 340337

Int. Cl.³ F22B *33/00*

U.S. Cl. 122—20 B **13 Claims**

1. A heating plant incorporating at least one boiler, means for supplying fuel and air to said at least one boiler, a flue gas exhaust duct associated with said at least one boiler, the heating plant including a waste heat recovery unit having heat exchange surfaces therein and wherein the flue gas exhaust duct from said at least one boiler is operatively connected to said waste heat recovery unit for the circulation therethrough of hot flue gases in contact with the heat exchange surfaces thereof, means to allow flow of fluid through said waste heat recovery unit thereby to recover a portion of the heat energy

in the flue gases; a heat exchanger; and a primary circuit connecting said at least one boiler in flow relation to said heat exchanger for the conveyance of the heat output of said at least one boiler thereto, a first fluid heating circuit being operatively connected to the heat exchanger, a second fluid circuit for connecting the waste heat recovery unit in flow relation with said first fluid heating circuit; control means including a control system and first and second control valve means for regulating, respectively, the flow through said primary circuit and the flow through the second fluid circuit to provide a desired temperature in the fluid flowing out of the heat exchanger via said first fluid heating circuit while assisting in maintaining the fluid flowing through the second fluid circuit and the waste



heat recovery unit above that temperature necessary to avoid excessive cooling of the flue gases within the waste heat recovery unit and consequent condensation of certain flue gas components on the heat exchange surfaces thereof, and wherein the control system is responsive both to the temperature of the fluid in the heat recovery unit and to the temperature of the fluid flowing from the heat exchanger via said first fluid heating circuit, said control system acting to substantially eliminate fluid flow through the second fluid circuit and the heat recovery unit when the temperature of the fluid in the latter is below a minimum selected temperature, and, after the minimum selected fluid temperature is reached, said control system being primarily responsive to the temperature of the fluid flowing out of the heat exchanger via said first fluid heating circuit.

4,370,950

ENGINE COOLING SYSTEM AND CONTROL VALVE ASSEMBLY PROVIDING MIXED OR UNMIXED HEAD AND BLOCK COOLING

Tatsumi Furukubo, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 27, 1981, Ser. No. 325,196
Claims priority, application Japan, Dec. 2, 1980, 55-169933
Int. Cl.³ F01P *3/02, 7/16*
U.S. Cl. 123—41.08 **30 Claims**

1. For an internal combustion engine comprising:

(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;

(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and

(c) a radiator formed with an inlet and an outlet;

a cooling system, comprising:

(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;

(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;

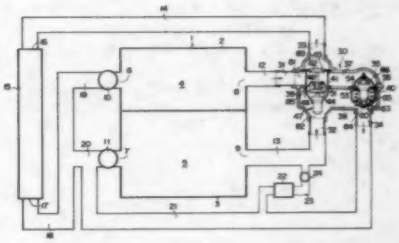
(f) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;

(g) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;

(h) a radiator output conduit system, leading from said outlet of said radiator to said cylinder head inlet of said head cooling jacket;

(i) a first junction assembly between said block recirculation conduit system and said main recirculation conduit system at upstream parts thereof, which at least sometimes allows flow between said part of said block recirculation conduit system and said part of said main recirculation conduit system;

(j) a second junction assembly between a downstream part of said block recirculation conduit system and a part of said radiator output conduit system, which at least sometimes allows flow between said part of said block recirculation conduit system and said part of said radiator output conduit system;



(k) and a mechanical non-electrical control valve assembly which is incorporated in one of said first junction assembly and said second junction assembly and which controls the allocation of flow through said head cooling jacket and flow through said block cooling jacket between said block recirculation conduit system and said main recirculation conduit system, according to a set of parameters which include the temperature of the cooling fluid passing out of said block cooling jacket;

said control valve assembly: when it detects a temperature of the cooling fluid flow passing out of said block cooling jacket of less than a first predetermined temperature, being so switched that it directs substantially all the cooling fluid flow through said head cooling jacket which is passing out through said cylinder head outlet and also substantially all the cooling fluid flow through said block cooling jacket which is passing out through said cylinder block outlet to flow into said upstream part of said block recirculation conduit system, said two cooling fluid flows being mixed within said block recirculation conduit system, not directing any substantial cooling fluid flow to flow into said upstream part of said main recirculation conduit system; when it detects a temperature of the cooling fluid passing out of said block cooling jacket of greater than said first predetermined temperature but less than a second predetermined temperature greater than said first predetermined temperature, being switched so that it directs substantially all the cooling fluid flow through said head cooling jacket which is passing out through said cylinder head outlet to flow into said upstream part of said main recirculation conduit system

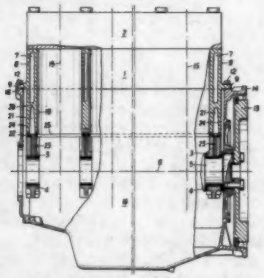
and through said radiator, and so that it directs substantially all the cooling fluid flow through said block cooling jacket which is passing out through said cylinder block outlet to flow into said upstream part of said block recirculation conduit system; and, when it detects a temperature of the cooling fluid passing out of said block cooling jacket of greater than said second predetermined temperature, being so switched that it directs substantially all the cooling fluid flow through said head cooling jacket which is passing out through said cylinder head outlet and also substantially all the cooling fluid flow through said block cooling jacket which is passing out through said cylinder block outlet to flow into said upstream part of said main recirculation conduit system and through said radiator, said two cooling fluid flows being mixed within said main recirculation conduit system and within said radiator, not directing any substantial cooling fluid flow into said upstream part of said block recirculation conduit system.

4,370,951

LIQUID COOLED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Colin T. Pomfret, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Jun. 5, 1981, Ser. No. 271,090
Claims priority, application Austria, Jun. 13, 1980, 3151/80
Int. Cl.³ F01M *1/06*
U.S. Cl. 123—41.74 5 Claims



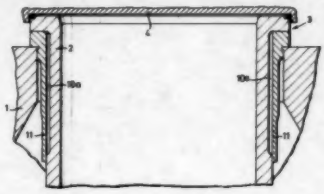
1. Liquid cooled multi-cylinder internal combustion engine, comprising a cylinder block with cylinder liners and a cooling jacket, a connecting flange running about said cooling jacket, a crankshaft and a crankcase, which extends above the axis of said crankshaft and which is fixed to said connecting flange, crankshaft main bearings each comprising an upper part and a lower part and being fixed to said cylinder block, and wherein the connecting surfaces of said cylinder block and said upper bearing parts are provided in the lower end plane of said cylinder liners, said cooling jacket being shorter than said cylinder liners, and conduits for the oil supply of the engine are formed in the end of said cylinder block adjacent said cooling jacket, which are open downwards, communicating with each other, and having at least approximately the same width as said cooling jacket, and a cover plate being provided between said cylinder block and said upper bearing parts, which tightly covers said conduits.

4,370,952

RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINE WITH AT LEAST ONE CYLINDER BUSHING

Hermann Mettig, Cologne, and Rudolf Jeschar, Clausthal-Zellerfeld, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Division of Ser. No. 927,884, Jul. 25, 1978, Pat. No. 4,253,431.
This application Oct. 6, 1980, Ser. No. 194,563
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734254
Int. Cl.³ F02F *1/16*
U.S. Cl. 123—41.84 3 Claims



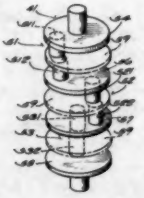
1. A reciprocable piston internal combustion engine which includes: an engine frame, a cylinder bushing inserted in said engine frame and having one end provided with a collar and being supported by said engine frame, said bushing together with said engine frame defining an annular chamber adapted to receive cooling water, a heat jacket operatively associated with said cylinder bushing and having a wall portion thereof arranged for contact with the content of said annular chamber, said heat jacket extending at least into the vicinity of said collar and while being adapted to receive and keep a liquid heat carrier therein having its inner surface so designed as to create a capillary effect adapted to permit such liquid heat carrier in said heat jacket to flow therein against the force of gravity in the longitudinal direction of said cylinder bushing said heat jacket being formed within said cylinder bushing.

4,370,953

CYLINDER TWO STROKE ENGINE WITH TORSIONAL RESONANCE CONTROL

Peter G. Van de Walker, Lake Villa, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 5, 1980, Ser. No. 146,257
Int. Cl.³ F02B *75/22*
U.S. Cl. 123—55 VS 11 Claims



1. A two stroke engine comprising a V engine block having first and second cylinder banks each with first, second, and third cylinders, said banks being located at a bank angle within the range of from about 60° to about 90°, means for establishing a cylinder firing order wherein one of said three cylinders of said first bank is first fired, followed by firing of said one of said three cylinders of said second bank, followed by firing of one of the remaining two of said three cylinders of said first bank,

followed by firing of said one of the remaining two of said three cylinders of said second bank, followed by firing of the remaining one of said three cylinders of said first bank, and followed by firing of the remaining one of said three cylinders of said second bank, means for establishing a cylinder firing interval constituted by a repetitious cycle of crankshaft angles between firings including a first firing interval angle followed by a second firing interval angle, wherein the sum of said first firing interval angle and said second firing interval angle equals about 120°, and a crankshaft having first, second, and third crankpins respectively associated with said first, second and third cylinders of both said banks, each of said crankpins being spaced from each other at an angle of about 120° and each of said crankpins including a first portion associated with one of said cylinders in said first bank and a second portion associated with one of said cylinders in said second bank and located in axially adjacent relation to said first portion at a splay angle from said first portion, said splay angle being approximately equal to the absolute value of the difference between said first firing interval angle and said bank angle.

4,370,954

APPARATUS FOR STARTING INTERNAL COMBUSTION ENGINE

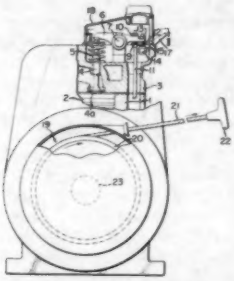
Tomohiro Asao, and Yosuke Takahashi, both of Osaka, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed May 9, 1980, Ser. No. 148,229

Claims priority, application Japan, Aug. 14, 1979, 54-111730[U]

Int. Cl.³ F01L *13/08*; F02N *3/02*

U.S. Cl. 123—182 **11 Claims**



1. An apparatus for starting an internal combustion engine, said engine including crankshaft rotatably mounted therein, an exhaust valve, and a valve actuating mechanism which comprises a valve spring biasing said exhaust valve to a closed position, a valve lever rockably mounted having two ends, and a push rod operatively coupled with said crankshaft and engaging one of said ends of said valve lever, the other end of said valve lever engaging and operating said exhaust valve, said apparatus comprising: a recoil starter including a rope provided with a knob associated therewith, a reel around which said rope is wound and a clutch adapted to transmit the rotation of said reel to the engine crank shaft; and a decompression device including a cam having a flat surface adapted to forcibly maintain the exhaust valve in an open position by pushing said one end of the valve lever, a rotatably mounted shaft on which said cam is fixed, and a shaft spring resiliently and rotatively biasing said shaft in a direction desengaging said cam from said valve lever, the amount of push of said one end of said valve lever by said cam being set to be smaller than that provided by the push rod of the valve actuating mechanism, said shaft spring being sized to exert a resilient force smaller than the valve spring of said valve actuating mechanism for said exhaust valve such that said cam is held in position by engagement of said flat surface with said valve lever, whereby, when said valve lever is pushed at its one end by said cam, said flat surface of said cam engages said valve lever keeping said exhaust valve in the opened state against the resilient force of said valve spring, whereas, when said push rod pushes said one end of said valve lever, said cam is rotated and automatically disengaged from said valve lever by the biasing action of said shaft spring.

4,370,955

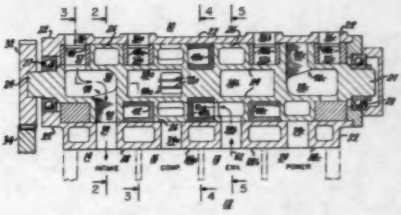
ROTARY VALVE FOR AN INTERNAL COMBUSTION ENGINE

John R. Ruggeri, 79 Apple Valley Rd., Stamford, Conn. 06903

Continuation-in-part of Ser. No. 21,444, Mar. 19, 1979, abandoned. This application May 11, 1979, Ser. No. 38,280

Int. Cl.³ F01L *7/00*

U.S. Cl. 123—190 BB **19 Claims**



1. In a rotary valve for supplying a fuel-air mixture to and exhausting exhaust gas from an internal combustion engine, comprising

(a) an outer stationary support member formed with a hollow interior,

(b) an inner member housed within the hollow interior, and

(c) bearing means supporting the inner member for rotation about an axis,

the outer support member and the inner rotatable member being formed with duct means and porting means for selectively enabling and preventing the flow of intake and exhaust gases through the valve duct means in accordance with the angular position of the inner rotatable member with respect to the outer support member,

the improvement comprising impeller means mounted within the portion of the duct means formed within the inner rotatable member, the impeller means moving in close proximity to an engine cylinder location at the porting means for providing the flow of intake gases to the cylinder, the impeller means comprising means for producing a mixing and supercharging effect in said intake gases introduced through the porting means to the cylinder upon rotation of the inner rotatable member, the impeller means comprising a plurality of blades mounted in planes extending radially with respect to the axis of rotation.

4,370,956

ARRANGEMENT FOR HEATING THE OIL CONTAINED WITHIN AN OIL RESERVOIR OF A MACHINE OR OF AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Gottfried Moser, Gladbach, and Hansjurgen Gross, Niederkassel, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,083

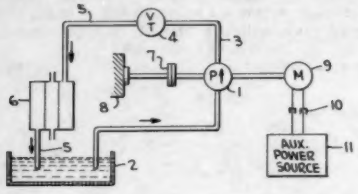
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940643

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 AB **8 Claims**

1. An arrangement for heating the lubricating oil contained within an oil reservoir of a machine or of an internal combustion engine of a motor vehicle, the machine or engine having a

lubricating oil distribution system including means for circulating the lubricating oil at a predetermined pressure level from the oil reservoir into pressurized oil lines of the machine or engine, a heating system including a hydraulic pump for suctioning the oil from said reservoir and returning it thereto through an oil conduit into which said pump is coupled, at least one operating element coupled into said conduit at the pressure side of said pump for constricting the flow of oil through said conduit, said pump being coupled with a source of power to be thereby driven, said pump having a capacity to produce a pressure of about one order of magnitude higher than said



predetermined pressure level effected by said circulating means, said source of power comprising one of said engine and a driving motor coupled with an auxiliary power source, a first releasable coupler located between said engine and said pump and a second releasable coupler located between said pump and said auxiliary power source for selectively coupling said pump with said engine or with said auxiliary power source for regulating said heating system as said pump is selectively driven by said engine or by said motor or by neither said engine nor said motor, whereby the temperature of the oil within said reservoir may be controlled before and after operation of the machine or engine.

4,370,957

ASSEMBLY OF AUXILIARY EQUIPMENT FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

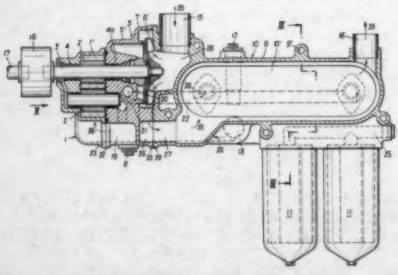
Othmar Skatsche; Johann Wagner, and Bertram Obermayer, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jan. 26, 1981, Ser. No. 228,219

Claims priority, application Austria, Jan. 24, 1980, 392/80

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 AB **2 Claims**



1. An assembly of auxiliary equipment for a water-cooled internal combustion engine, having an oil pump, a water pump, an oil cooler/oil filter unit, characterized in that the oil pump, the water pump and the oil cooler/oil filter unit are provided as separate interchangable subassemblies and are combined and interconnected into a constructional unit that can be mounted on the internal combustion engine, and said oil cooler/oil filter unit including a housing provided with a mounting surface for attachment to the internal combustion engine, first and second mating flanges on the housing and on the water pump being fastened together, third and fourth mating flanges on the water pump and on the oil pump being fastened together, and oil and water connecting lines extending through the flanges.

4,370,958

METHOD OF OPERATING AN AIR-COMPRESSING, SELF-IGNITING ENGINE FOR LIQUID FUEL

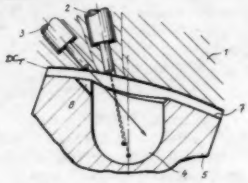
Franz Pischinger, Im Erkfeld 4, 5100 Aachen, Fed. Rep. of Germany, and Cornelis Havenith, Kerkrade, Netherlands, assignors to Franz Pischinger, Aachen, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,710

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901211

Int. Cl.³ F02B *3/08*

U.S. Cl. 123—276 **4 Claims**



1. A method of operating an air-compressing, self-igniting internal combustion engine with liquid fuels, which engine includes a combustion chamber depression positioned centrally in the top surface of a piston and formed about a longitudinal axis through the piston for receiving injected fuel and for receiving rotating combustion air at the time of fuel injection from an air intake valve opening positioned in a cylinder head at a location laterally of the depression, said method comprising in combination the steps of:

injecting into said combustion chamber depression an ignition-prone fuel selected from the group consisting of oil, fuel, gas oil, and diesel fuel for initiating and maintaining fuel combustion; wherein the ignition-prone fuel is injected in two simultaneously injected diverging streams from a location positioned over but inside the boundaries of the depression, the location being angularly displaced by about ninety degrees with respect to the axis of the depression from a line through the center of the intake valve opening and the axis of the depression, and the two streams being directed at a relatively steep angle with respect to the axis toward the bottom of the depression;

injecting into said combustion chamber depression an ignition-adverse, oxygen-containing liquid alcohol selected from the group consisting of methanol and ethanol as a main fuel; wherein the ignition-adverse fuel is injected from a location over, but outside the boundaries of, the depression, which location is angularly spaced with respect to the axis of the depression from the line through the center of the intake valve opening and the axis of the depression by an angle less than that of the location of injection of the ignition-prone fuel and which location is positioned adjacent to the edge of the intake valve opening; the angle of injection of the ignition-adverse fuel being less steep with respect to the axis of the depression and being directed between the location of the ignition-prone fuel injection and the axis of the depression whereby separate droplet veils are formed for both fuels at least until self-ignition of the ignition-prone fuel;

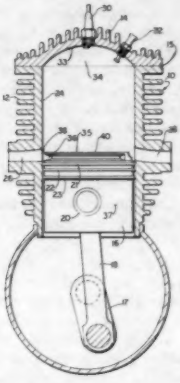
timing the injection of the fuels so that the injections overlap by beginning the injection of the ignition-prone fuel prior to the injection of the ignition-adverse fuel; beginning the injection of the ignition-adverse fuel prior to the self-ignition of the ignition-prone fuel, and by injecting ignition-prone fuel during the entire duration of injection of the ignition-adverse fuel.

4,370,959

TWO STROKE CYCLE ENGINE WITH SUSTAINED POWER STROKE

Robert J. McNair, Jr., Cincinnati, Ohio, assignor to Avco Corporation, Greenwich, Conn.

Filed May 30, 1980, Ser. No. 154,744
Int. Cl.³ F02B 17/00
U.S. Cl. 123—295 14 Claims



1. A two stroke cycle internal combustion engine of the type wherein there is included at least one cylinder member, a piston within the cylinder member reciprocable through a predetermined stroke volume, a cylinder head formed to provide a main combustion chamber closed at one end, the other end of said combustion chamber being the crown of said piston, said piston being movable within the sidewalls of said cylinder member from a top dead center position wherein said crown is adjacent said cylinder head to a bottom dead center position wherein said crown is remote from said cylinder head, the invention comprising:

fuel injection means for supplying a fuel-rich mixture to the main combustion chamber during the compression stroke wherein the piston moves to minimize the volume in the main chamber;

firing means for igniting the fuel-rich mixture near the top dead center position of the piston to bring about a power stroke preceded by a flame front propagating across the main chamber from an ignition point;

exhaust means for permitting the exhaust gases to escape the main combustion chamber near the end of the power stroke wherein the piston moves to the bottom dead center position;

a resonator cavity formed in and around the periphery of the piston at a location below the crown, said cavity being in communication with the main combustion chamber via a narrow circumferential slot formed between said cylinder wall and the top edge of said piston;

an intake port through said cylinder wall adjacent the crown of said piston as said piston approaches its bottom dead center position, said intake port being open when said piston is adjacent its bottom dead center position, said intake port being closed when said piston is not adjacent said bottom dead center position; and

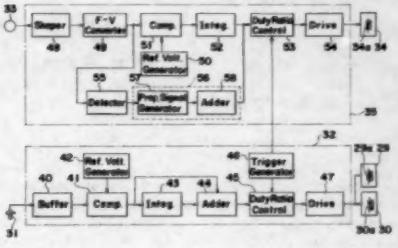
means for supplying air to said main chamber and said resonator cavity through said intake port during the period said piston is adjacent said bottom dead center position, said period being at the conclusion of the power stroke of said engine, said air supplying means causing air to flow through said resonator cavity and said chamber and over said piston crown and through said exhaust means at the conclusion of each power stroke thereby serving to cool the crown of said piston during each recharging of the main chamber.

4,370,960

ENGINE SPEED CONTROL SYSTEM

Kazutoshi Otsuka, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 5, 1980, Ser. No. 204,252
Claims priority, application Japan, Nov. 6, 1979, 54-144026
Int. Cl.³ F02M 3/00
U.S. Cl. 123—339 4 Claims

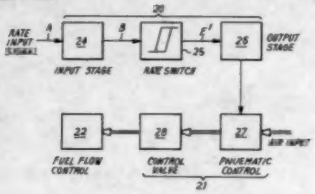


1. An engine idle control system for an automobile internal combustion engine comprising a source of a combustible air fuel mixture, a mixture intake passage means for supplying said combustible mixture from said mixture source to said engine, and an exhaust passage means through which exhaust gases formed in said engine as a result of combustion of said combustible mixture are discharged to the atmosphere, said idle control system comprising an actuator means for controlling the engine speed to a predetermined value; a speed sensor for detecting the engine speed and for generating an electric output signal indicative of the actual engine speed; a control means connected to said speed sensor and said actuator means for receiving said electric output signal from said speed sensor and for operating said actuator means so as to maintain the engine speed during idling at said predetermined speed, said control means having a first means for generating a control signal for causing said actuator means to control the engine speed in response to an input signal to the first means, a second means for comparing said electric output signal from said speed sensor with a reference signal representative of said predetermined engine speed and for generating a difference signal indicative of the difference between the actual engine speed and said predetermined engine speed, a third means for detecting the magnitude of change occurring in said electric output signal from said speed sensor and for generating an output signal only when said magnitude of change exceeds a predetermined magnitude, wherein said detecting means includes a timer means for generating an output signal at a predetermined time interval and a comparator means for comparing said output signal generated by said speed sensor at a certain time with the output signal generated by said speed sensor when said predetermined time interval has passed beyond said certain time and for generating an output signal when the difference therebetween is higher than a predetermined value, and a fourth means for adding said difference signal and said electric output signal from said comparator means of said third means and for generating an output signal indicative of the sum of said difference signal and said electric output signal from said comparator means of said third means, said output signal from the fourth means being supplied to the first means as said input signal to the first means, whereby said control signal is changed so as to cause the operation of said actuator to be increased when the magnitude of detected change of the engine speed is large.

4,370,961
FUEL RATE CONTROL FOR INTERNAL COMBUSTION ENGINES

Derek Brown, 7 Southlands, Eighton Banks, Gateshead 9, Tyne & Wear NE9 7BP, England

Filed Sep. 15, 1980, Ser. No. 186,963
Int. Cl.³ F02D 31/00
U.S. Cl. 123—352 7 Claims

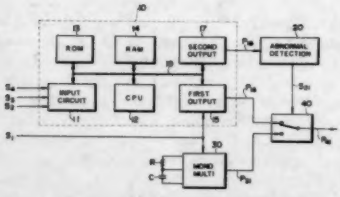


1. In a motor vehicle equipped with power take-off apparatus driven by an internal combustion engine and including a rotary power take-off output shaft, the improvement comprising: sensor means arranged and adapted to produce pulses at a repetition rate proportional to the speed of rotation of said rotary output shaft; rate discriminating circuitry operatively coupled to said sensor means to receive said pulses and discriminate between pulse repetition rates above and below at least one predetermined rate; rate level indicating means coupled to said rate discriminating circuitry means to provide a binary output signal indicative by the prevailing level thereof of the relation of the pulse repetition rate to said at least one predetermined rate; and flow rate control means coupled to said rate level indicating means and responsive to said binary output signal to control a flow of fuel to said internal combustion engine, said flow rate control means being such as to reduce said flow of fuel in response to the level of said binary output signal indicating a pulse repetition rate exceeding at least said one predetermined rate, said rate discriminating circuitry including an astable multivibrator coupled to said sensor means so as to be inhibited by pulse repetition rates exceeding said one predetermined rate, and said rate level indicating means including a monostable circuit connected to said astable multivibrator so as to reset only in response to said astable multivibrator being inhibited for a predetermined length of time.

4,370,962
SYSTEM FOR PRODUCING A PULSE SIGNAL FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Mar. 23, 1981, Ser. No. 246,618
Claims priority, application Japan, Mar. 24, 1980, 55-36259
Int. Cl.³ F02P 5/04; F02D 5/02
U.S. Cl. 123—416 16 Claims



1. A system for normally producing a first pulse signal for controlling an automotive internal combustion engine in response to engine operating parameters, such as engine crankshaft reference angle position pulses, air intake volume and engine temperature, and for producing a second pulse signal for controlling the engine in the event of a failure of circuitry responsive to the parameters, comprising:

(A) a digital computer responsive to the parameters for controlling the derivation of engine control pulses in accordance with the parameters, said computer including:

(a) a first output circuit responsive to the reference angle pulses for deriving engine control pulses, and

(b) a second output circuit for deriving a marker pulse signal having a regular pulse interval; and

(B) a circuit for producing a dummy control signal in response to a computer malfunction, including:

(a) a first retriggerable monostable multivibrator responsive to the marker pulse signal derived by said second output circuit, said first retriggerable monostable multivibrator deriving a first switching signal in response to the pulse interval of the pulse signal produced by the second output circuit exceeding a first predetermined length of time;

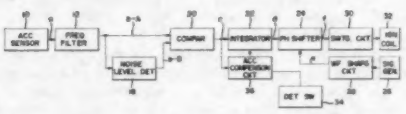
(b) a monostable multivibrator responsive to the reference angle pulse signal for deriving further control pulses synchronized with the reference angle position pulses; and

(c) switching means having an output terminal and an input connected to be controlled by said first retriggerable monostable multivibrator for normally coupling the control pulses derived by said first output circuit to the output terminal and for coupling the further pulses derived by said monostable multivibrator to the output terminal while said first switching signal is derived.

4,370,963
IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshio Iwata, and Kiyoshi Ookawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1980, Ser. No. 152,114
Claims priority, application Japan, May 25, 1979, 54-66011
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 4 Claims



1. An ignition timing control system comprising:

reference ignition timing generator means for generating a reference ignition timing signal including reference ignition timing points;

an ignition coil;

switching means responsive to said reference ignition timing generator means for intermitting a current supplied to said ignition coil;

phase shifting means receiving said reference ignition timing signal for transmitting said reference ignition timing signal to said switching means;

knocking detector means for detecting the occurrence of knocking in an internal combustion engine and for generating a pulsed output representative thereof and for generating a null output in the absence of knocking:

integrator means for receiving said outputs from said knocking detector means, for generating a null voltage upon receipt of said null output, and for integrating said pulsed output upon receipt thereof and generating an integrated voltage dependent upon said knock signal components;

said phase shifting means being connected to said integrator means and being responsive to receipt therefrom of said null voltage for transmitting said reference ignition timing

signal to said switching means, and said phase shifting means being responsive to receipt from said integrator means of said integrated voltage for retarding the phase of said reference ignition timing signal by an amount dependent upon the level of said integrated voltage;

detection means for detecting abrupt acceleration of the internal combustion engine; and

acceleration compensation circuit means, connected to said integrator means, for, in response to a detection of abrupt acceleration by said detection means, shortening the time constant of said integrator means and rapidly increasing said integrated voltage, and thereby for increasing the amount of retard of the phase of said reference ignition timing signal.

4,370,964

SPARK IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

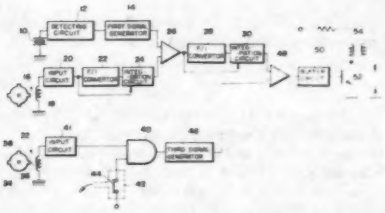
Shigeo Muranaka, Yokohama; Kunihiko Sugihara, Tokyo, and Kiyoshi Takeuchi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 4, 1980, Ser. No. 174,923

Claims priority, application Japan, Aug. 6, 1979, 54-100111

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **12 Claims**



1. A spark ignition timing control system for an internal combustion engine having a plurality of combustion chambers comprising:

a knock detection means for generating a first signal indicative of a retarding ratio of spark advance angle which corresponds to a magnitude of detected knocking; and

a means for detecting an engine load condition and operable to distinguish whether the engine load is higher than a predetermined level and to retard the spark advance angle of an ignition signal for a first group of said chambers when the detected load is higher than said predetermined level whereby the spark advance angle of a second group of said chambers, comprising at least one of said chambers, becomes advanced relative to the first group under high load conditions.

4,370,965

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

Horst Grossner, Bergien; Detlef Kaminski, Kornwestheim, and Paul Schwerdt, Freudenstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

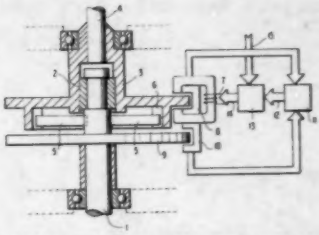
Filed Apr. 27, 1981, Ser. No. 257,467

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015807

Int. Cl.³ F01L *1/34*; F02P *1/00*

U.S. Cl. 123—426 **7 Claims**

1. An ignition distributor for an internal combustion engine having an electronic ignition control means, the distributor including a distributor shaft means driven by the engine, and a rotor means, characterized in that means are provided for changing a phase relationship between the distributor shaft means and the rotor means including a control disk mounted on the distributor shaft means so as to be rotatable relative thereto, the rotor means is fixedly mounted to the control disk, means for transmitting a rotation of the distributor shaft means to the control disk, and means for regulating a rotational speed



of the control disk in accordance with a difference between an actual value of a phase displacement and a desired value of a phase displacement for a given operating condition of the engine.

4,370,966

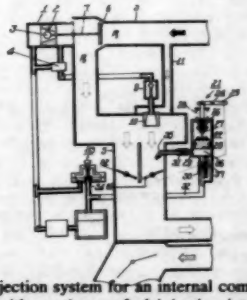
FUEL FEED SYSTEM

Masahiro Saruta, and Hiroki Uchiyama, both of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Mar. 26, 1979, Ser. No. 24,166

Int. Cl.³ F02M *39/02, 45/00*

U.S. Cl. 123—447 **2 Claims**



1. In a fuel injection system for an internal combustion engine operating with continuous fuel injection into a suction pipe, said suction pipe including a first portion and a second portion downstream of said first portion, a throttle valve in said second portion, said system including a fuel measuring gate having a fuel control aperture, a sensor member positioned between said first and second portions and being moveable in proportion to the quantity of air flowing therebetween, said sensor member being operatively coupled to said fuel control gate to determine the size of said aperture to control the amount of fuel therethrough, a bypass line coupled between said first and second portions, and a pressure regulator coupled to said fuel measuring gate to supply fuel thereto at a predetermined pressure, said regulator having a return pipe, said continuous fuel injection from said fuel measuring gate being into said second portion; the improvement comprising

an accelerator pump interlocked to said throttle valve for injecting additional fuel at a positive pressure through a delivery port during acceleration, said accelerator pump being coupled to and drawing fuel from said return pipe, said delivery port opening into said second portion at a position different than said continuous injection.

4,370,967

FUEL INJECTION SYSTEM

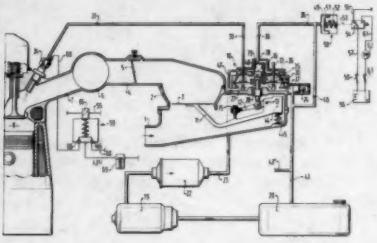
Karl Gmelin, Ingelfingen; Peter Stiefel, Ditzingen, and Klaus-Jürgen Peters, Affalterbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,361

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2841920

Int. Cl.³ F02M *69/00*

U.S. Cl. 123—452 15 Claims



1. A fuel injection system for mixture-compressing, externally ignited internal combustion engines arranged to inject fuel into an intake manifold, said system including an air flow rate-responsive member and an arbitrarily actuatable throttle valve, said air flow rate-responsive member being moved in accordance with the quantity of air flowing therethrough and arranged to displace a control slide mounted in a metering and distribution valve disposed in a fuel supply line and thereby meter a quantity of fuel from a predetermined point which corresponds to the air quantity, said metering operation arranged to take place at a constant pressure difference in that one control valve each is inserted into the fuel flow downstream of said metering points, further wherein each said valves have a flow passage cross section which is variable by means of a yielding member which defines plural, pressurized chambers, said pressure within said chambers adapted to move said yielding member in the direction of opening the control valves, further wherein said control slide includes an end face which projects into another pressure chamber to open a flushing line which communicates with flushing channels that branch off from said fuel supply line, said flushing line and flushing channels being arranged to connect said other pressure chamber with said control valves and further that downstream of an uncoupling throttle a hydraulic reservoir is disposed in a control pressure line, said reservoir including a diaphragm arranged to open a flushing valve which in turn opens an outlet line from each individual injection valve to a return flow line and wherein above a certain fuel pressure the electrical circuit of a starter motor is closable by means of an electrical pressure switch actuatable in accordance with the fuel pressure in the control pressure line.

4,370,968

ELECTRONICALLY CONTROLLED, FUEL INJECTION METHOD

Takayoshi Nakatomi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

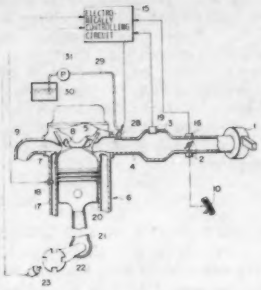
Filed Nov. 20, 1980, Ser. No. 208,814

Claims priority, application Japan, Jul. 25, 1980, 55/101092

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—488 5 Claims

1. An electronically controlled fuel injection method for controlling a fuel injection valve of an intake system by electric signals characterized in that: from an input level X_{n-1} to be fed into a computation section from sensors at a previous fuel injection rate computation time T_{n-1}, an input level X_n to be fed into said sensors at a present fuel injection rate computation time T_n, a delay time until a physical amount to be detected reaches an input point in the computation section by way of said sensors, and a time A_n at which a cylinder to which



a fuel is supplied by an amount based on the present fuel injection rate computation reaches a bottom dead center on a subsequent intake stroke, the following equation is computed;

$$C_n = (X_n - X_{n-1}) \cdot \frac{1}{T_n - T_{n-1}} \cdot (\tau + A_n - T_n) + X_n$$

and, C_n is used as data on said physical amount for executing a present fuel injection rate computation.

4,370,969

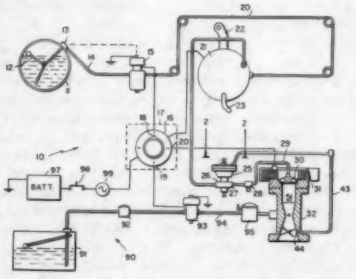
PROPANE AUTOMOTIVE FEED SYSTEM

Neal Zarrelli, 200 Central Park S., New York, N.Y. 10017; Joseph V. Bocassi, and Robert S. Miller, both of Garnerville, N.Y., assignors to Neal Zarrelli, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,323

Int. Cl.³ F02M *21/02, 29/00*

U.S. Cl. 123—525 19 Claims



1. A device for providing propane gas as a secondary fuel to a carburetor of an internal combustion engine utilizing a primary fuel, said device comprising, a body portion being formed with a plurality of outlet holes for the propane, said body portion comprising a cover plate being formed with said outlet holes, said holes being radially disposed from said inlet orifice, said inlet conduit being centrally disposed and extending upwardly from the body portion, and means to mount said body portion downstream of the carburetor air filter intake and upstream of the primary fuel intake, inlet conduit means being formed with an inlet orifice and being mounted on and communicating with said body portion to feed gaseous propane to said body portion and into said holes, said air filter being annular-shaped, and said mounting means comprising a bracket interconnecting said air filter with said body portion so that said

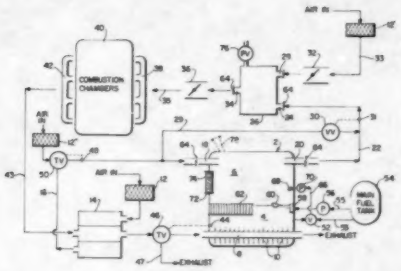
inlet conduit is disposed in the center of said air filter, said cover plate being shaped and downwardly disposed so that said outlet holes direct the propane gas outwardly and downwardly from the cover plate, wherein said propane and air admix adjacent said holes so as to provide a propane-air mixture to the carburetor.

4,370,970

APPARATUS FOR SUPPLYING A FUEL/AIR MIXTURE TO AN INTERNAL COMBUSTION ENGINE

Paul R. Kunz, Bern, Id. 83220

Filed Jan. 15, 1980, Ser. No. 112,351
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **24 Claims**



1. Apparatus for supplying a fuel/air mixture to an internal combustion engine comprising:

(a) a fuel chamber comprising a lower portion for containing a body of volatile liquid fuel in a substantially quiescent state and an upper portion defining an enclosed vapor space free of liquid fuel during normal operation above said body of said liquid fuel;

(b) heating manifold means extending through said lower chamber portion for conducting hot exhaust gases therethrough in order to heat a body of volatile liquid fuel therein;

(c) means comprising an inlet and an outlet opening directly into said enclosed vapor space for drawing an air stream through said enclosed vapor space and entraining fuel vapors in said air stream without said air stream passing through said body of liquid fuel and without liquid fuel being entrained in said air stream;

(d) means for passing said air stream in heat exchange relation with hot exhaust gases to raise the temperature of the air stream prior to drawing the air stream through said vapor space;

(e) means for mixing said fuel vapor-containing air stream with additional air to produce a combustible fuel/air mixture;

(f) means for conveying said combustible fuel/air mixture to a combustion chamber of an internal combustion engine;

(g) means for preventing entry of sparks or flame into said enclosed vapor space; and

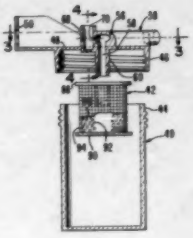
(h) means comprising two apertures located in opposite walls of said fuel chamber from each other, each aperture communicating between said enclosed vapor space and the ambient atmosphere, and each aperture being closed by a resilient blowout plug ejectable from said aperture if the pressure in said chamber exceeds a predetermined level.

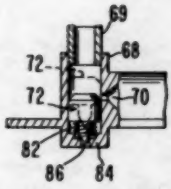
4,370,971

APPARATUS FOR REMOVING CONTAMINANTS FROM CRANKCASE EMISSIONS

Elmer W. Bush, 2010 Trimble Way, Sacramento, Calif. 95825

Filed Sep. 8, 1980, Ser. No. 185,051
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—573 **8 Claims**





1. Apparatus for processing crankcase emissions of an internal combustion engine having an intake manifold comprising: a container having an inlet port, an outlet port, and an ambient air intake port, the ports communicating with the interior of the container, said inlet port adapted to receive crankcase emissions from said engine, there being means in the container for separating the crankcase emissions into liquid, solid and gaseous fractions, the outlet port adapted to be coupled to the intake manifold of the engine so that the interior of the container will be subject to the vacuum of the intake manifold; a valve member; means coupled with the container for mounting the valve member for movement into and out of an operative position closing said air intake port; means for providing fluid communication between the interior of said container and said valve member so that said valve member is movable out of said operative position as a function of the vacuum in said container;

and means for biasing said valve member toward said operative position.

4,370,972

ATTACHMENT MEMBER FOR SECURING THE ENDS OF CABLES IN A COMPOUND BOW

William R. Stewart, and Gary Simonds, both of Gainesville, Fla., assignors to Victor United, Inc., Chicago, Ill.

Filed Aug. 6, 1980, Ser. No. 175,890
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—23 R **11 Claims**

7. A compound archery bow having wheels eccentrically mounted upon pivot pins disposed adjacent the bow limb tips, a cable passing around said wheels and having free ends attached adjacent said wheels, a cable end attachment member mounted upon at least one said pivot pin, said attachment member including a body having a base section provided with a cable passageway therethrough for longitudinally adjustably receiving a cable end therein, lock means selectively engageable with said cable end within said base section passageway,

said body including two opposite faces joined by a peripheral edge, said edge having a plurality of intersecting walls, said lock means including a threaded opening extending from another one of said walls to said cable passageway, a threaded lock device insertable within said opening, said body provided

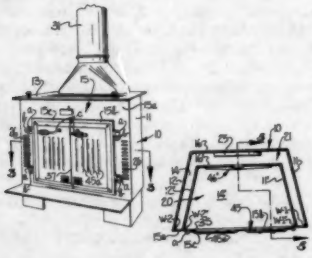
with a transverse anchor bore extending therethrough between said two opposite faces and disposed through said cable passageway, said threaded opening communicating with said bore, and a pivot section integral with said section and having means adapted to receive said pivot pin.

4,370,973

SPACE HEATING STOVE WITH STRESS RELIEVING WALLS

Anthony R. Bolanos, 2725 E. Dorchester Pl., Charlotte, N.C. 28209

Filed May 30, 1980, Ser. No. 154,828
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—58 **1 Claim**



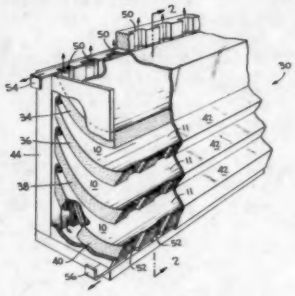
1. A space heating, wood burning stove comprising:
a plurality of wall means, defining a combustion chamber, each formed of steel plate having a substantially uniform thickness, and including a front wall comprising a substantially vertical panel having an access opening therethrough for insertion into said combustion chamber, a pair of doors normally closing said access opening and being provided with proximal normally abutting substantially vertical side edges thereon, said panel and said doors being of substantially the same thickness, and hinge means pivotally connecting distal side edge portions of said doors to said panel and including hinge elements pivotally supporting said doors,
welded joints securing said hinge elements to said panel, and means for controlling distortion in said doors and for protecting said welded joints against excessive stress and comprising a concavo-convex area forming a limited portion of the area of said one wall and defined by a plurality of elongate, generally parallel striations, with at least one of the striations being concave when viewed from one side of said one wall and with at least one other of said striations being convex when viewed from the same side of said one wall, said concavo-convex area being of generally sinusoidal cross-sectional configuration.

4,370,974

INVERTED CHANNEL FOCUSING SOLAR COLLECTOR

Donald R. Maxey, 22522 Shiloh Church Rd., Boyds, Md. 20720

Filed Mar. 12, 1980, Ser. No. 129,649
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **15 Claims**



1. A solar device comprising a horizontally oriented radiant and thermal energy absorber and a collector having two reflective curved planar surfaces curving downward from said absorber from a common side of a vertical plane drawn tangent to said absorber, one of said planar surfaces curving downward from one side of said absorber, and the other of said planar surfaces curving downward from the opposite of said one side of said absorber and each being in direct thermal conductive contact with said absorber, said curved planar surfaces supported by said horizontally oriented absorber, wherein the lowermost of said curved reflective surfaces approaches a plane of horizontal tangency sufficiently forward of the horizontal tangency of the uppermost reflective surface to delineate an aperture plane for the entrance of solar radiation which has an optimum angular inclination for the latitude; said reflective surfaces conforming essentially with the geometry of a cusp of the second kind in that they would intercept along a line of double tangency to a common reference plane if extended above said horizontally mounted radiant and thermal energy absorber.

4,370,975

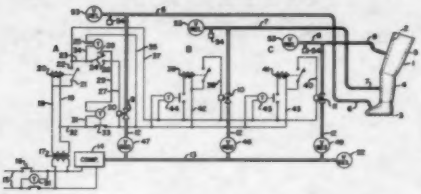
APPARATUS PROMOTING FLOW OF A BODY FLUID IN A HUMAN LIMB

Edward S. Wright, 837 Larchmont Rd., Pittsburgh, Pa. 15243

Filed Aug. 27, 1980, Ser. No. 181,712
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—64 **5 Claims**

1. Apparatus for promoting flow of a body fluid from one end of a human limb to the opposite end, comprising a double wall sheath for receiving such a limb, the outer wall of the sheath being relatively inelastic and the inner wall being flexible with an air chamber therebetween, said chamber being separated into a plurality of separate inflatable cells encircling said inner wall with the outer wall of each cell provided with an opening, a source of air under pressure, tubes connecting

said source with said openings, a plurality of normally closed valves respectively connected with respective of said tubes for valving the respective tubes open and closed independently, adjustable timing means operatively connected with the valves for opening said valves for independently adjustable periods of



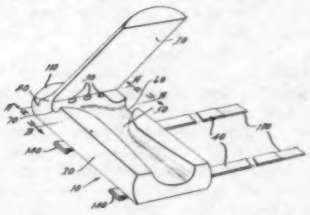
time to inflate said cells for independently adjustable periods of time and then releasing the air pressure from all of the cells, and pressure regulating means connected with said tubes for delivering progressively less air pressure to each successive cell from one end of said sheath to the other end.

4,370,976

DYNAMIC FOAM ORTHOSIS

Joseph Wanchik, Harper Woods, and Joseph M. Gabriele, Fenton, both of Mich., assignors to Contour Fabricators, Inc., Grand Blanc, Mich.

Filed Jun. 3, 1980, Ser. No. 156,253
Int. Cl.³ A61F 5/10
U.S. Cl. 128—77 **4 Claims**



1. A device for use in providing active forces necessary to substitute for decreased, absent, or abnormal muscle function in a wrist and hand comprising:

an unsupported, relatively resilient, cellular foam base contoured with a cavity adapted to mate with and partially support the subject wrist and hand and adjoining forearm, and wherein said base contains three holes therethrough to allow for placement of the patient's middle three fingers,

an unsupported, relatively resilient, cellular foam cover formed integrally with said base and movable with respect to said base from a closed position in which said cover is in engagement with said base to an open position in which the contoured cavity of said base is exposed so as to allow the subject wrist and hand to be placed therein, and

at least one restraining strap means for holding said cover in engagement with said base once the subject wrist and hand have been placed in the contoured cavity of said base,

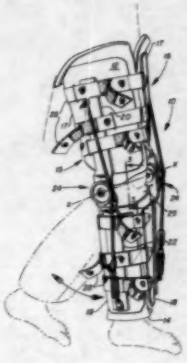
said device providing active forces on the subject wrist and hand which change as the position of the subject wrist and hand changes.

4,370,977

KNEE AND ELBOW BRACE

Donald M. Mauldin, and Richard E. Jones, III, both of Dallas, Tex., assignors to Kenneth D. Driver, Dallas and Melvin L. Stills, Lewisville, both of, Tex., part interest to each

Filed May 4, 1981, Ser. No. 260,075
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 F **17 Claims**



1. The knee brace comprising:

a thigh plate shaped to conform to the thigh of the leg;

a calf plate shaped to conform to the calf of the leg;

said thigh plate and calf plate being positioned on the thigh and calf when the knee brace is mounted on the leg so that the center lines of said thigh and calf plates lie on the mid-lateral line of the leg;

a thigh stay secured on the outer surface of said thigh plate and extending to a first hinge portion of a hinge moment adjacent the knee joint when positioned on the leg;

a calf stay secured on the outer surface of said calf plate and extending to a second hinge portion of said hinge member adjacent the knee joint when positioned on the leg;

means for limiting the pivotal motion of said hinge member to confine the motion of the joint within a preselected arc including an arc of zero degrees to immobilize the knee and for establishing a predetermined angular relationship between the hinge portions and thereby controlling the degree of flexion of the knee;

spring means interconnecting said upper and lower sections for creating a moment about the pivotal axis of said hinge member for urging said upper and lower sections toward a predetermined relationship;

fastening means for securing the thigh and calf plates to the leg.

4,370,978

KNEE BRACE

Pasquale M. Palumbo, 906 Frome La., McLean, Va. 22101

Filed Oct. 21, 1981, Ser. No. 313,674
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 C **9 Claims**

1. A knee brace for stabilizing a patella throughout the normal range of flexion and movement of the knee comprising:

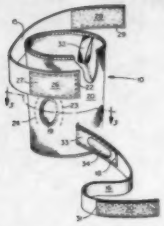
a sleeve member;

a first arm member, the first end of which is adapted to be circumferentially wrapped about the knee above the patella, the second end of which is attached to said sleeve member;

first and second means for bracing the patella attached to said sleeve member and adapted to be positioned medially and laterally of the patella when the brace is in use to stabilize the patella;

a second arm member, the first end of which is adapted to be

circumferentially wrapped about the knee below the patella, the second end of which is connected to said sleeve member; and



third means for bracing the patellar ligament operatively associated with said second arm member and adapted to apply direct pressure to the patellar ligament when the brace is in use.

4,370,979

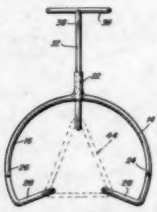
SUSPENSORY URINAL SHEATH EXPANDER

Dale L. Erickson, Box 283, Frederic, Wis. 54837

Filed Apr. 21, 1981, Ser. No. 257,429

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—303 A **6 Claims**



1. A urinal sheath support and expander including first stationary jaw means for insertion into the inlet end portion of a urinal sheath in close opposition to the internal surfaces of said inlet end portion at one side thereof, second movable jaw means guidingly supported from said stationary jaw means and for insertion into said inlet end portion in close opposition to the internal surfaces of said sheath at the other side thereof, said movable jaw means being supported from said stationary jaw means for shifting away from said stationary jaw means, said stationary and movable jaw means, when shifted away from each other, being operable to spread to inlet end portion of said sheath for free unobstructed insertion of a penis thereinto, said stationary jaw means including a pair of divergent arm portions including base and free ends, said free ends being spaced apart, means joining said base ends, guide structure stationarily supported relative to said base ends, a support rod shiftably supported from said guide structure and including a free end advanceable to a position disposed in a path extending between the free ends of said divergent arm portions, said free ends including elongated generally parallel jaw elements disposed generally normal to said arm portions and rod, said rod being displaceable away from said free ends of said arm portions to thereby displace the jaw element carried by said rod laterally away from a plane containing the jaw elements supported from said free ends of said arm portions, said divergent arm portions being generally quarter circular in shape and the base ends thereof being coextensive, said guide structure being supported from the base ends of said arm portions, said guide structure comprising a guide sleeve through which said rod is longitudinally slidably received, said free ends of said divergent arm portions being spaced substantially equally on opposite sides of the longitudinal center line of said sleeve.

4,370,980

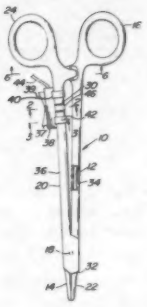
ELECTROCAUTERY HEMOSTAT

Edward A. Lottick, 789 Wyoming Ave., Kingston, Pa. 18704

Filed Mar. 11, 1981, Ser. No. 242,746

Int. Cl.³ A61B *17/38*

U.S. Cl. 128—303.17 **8 Claims**



1. An electrocautery and hemostatic clamping device, comprising:

a first and second pivoted members pivoted at a point between the ends of said members, said members being comprised of a conductive material;

said first and second pivoted members being provided with mating jaws at one end, said mating jaws being of a cross-section adapted for probing during the performance of surgery;

said first and second members being provided with handle means at a predetermined distance from the jaws and adjustable retaining means for retaining said jaws in a predetermined clamping position;

an insulative covering applied over said first and second members extending substantially from the point of pivot to said handle means with at least one opening therethrough for an electrical connection to one of said members; and

electrical switch means adapted to be releasably attached to one of said members, said electrical switch means being provided with means for being connected to an electrical source, said electrical switch means being provided with an electrical connector for connecting through said opening in said insulative covering of said member to which said electrical switch means is attached whereby through operation of said electrical switch means an electrical potential may be applied to said members for cauterizing.

4,370,981

PROTECTIVE DEVICES AND METHODS

Brian A. Sanderson, Broom, Nr. Biggleswade, England, assignor to Smith & Nephew Associated Companies, Ltd., London, England

Filed Sep. 22, 1980, Ser. No. 189,621

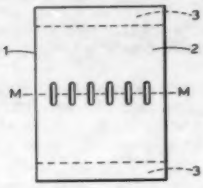
Claims priority, application United Kingdom, Sep. 27, 1979, 7933560; Feb. 15, 1980, 8005292; Mar. 1, 1980, 8007047

Int. Cl.³ A61F *13/02*

U.S. Cl. 128—334 R **5 Claims**

1. A flexible adhesive skin closure having a central portion provided with apertures sufficient for the manipulation of would edges wherein said skin closure is of rectangular shape in which the length of one pair of opposing edges is not more than twice that of the other pair of opposing edges and which in use consists essentially of a polyurethane film coated on one

surface with an adhesive and which coated film is flexible, elastic, air permeable, impervious to bacteria and liquid and has



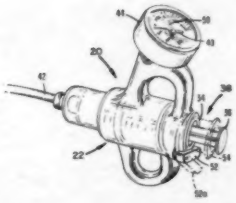
a moisture vapor permeability of at least 500 $g/m^2/day/40°$ C./100-20% relative humidity difference.

4,370,982

METHOD AND APPARATUS FOR INJECTING AND FOR CONTROLLING THE PRESSURE OF FLUID BEING INJECTED INTO A CATHETER

David M. Reilly, Glenshaw, Pa., assignor to Medrad, Inc., Pittsburgh, Pa.

Filed Sep. 10, 1980, Ser. No. 185,737
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—98 **18 Claims**



1. A pressure sensing device for measuring the fluid pressure in a closed system, the pressure in the closed system being varied by the movement of a syringe piston in a syringe barrel having a distal delivery end in fluid communication with the closed system, said pressure sensing device comprising:

(a) a housing having a passageway extending therethrough for receiving a syringe barrel having a distal delivery end connectable to a closed system; and

(b) pressure sensing means connected to said housing for sensing pressure changes in a fluid contained within the syringe barrel, said pressure sensing means including:

(1) first means for sensing and for generating a signal representative of movement of the syringe barrel with respect to said housing, the syringe barrel being received in the housing in such manner that movement of the syringe barrel is proportional to pressure changes of a fluid contained within the syringe barrel; and

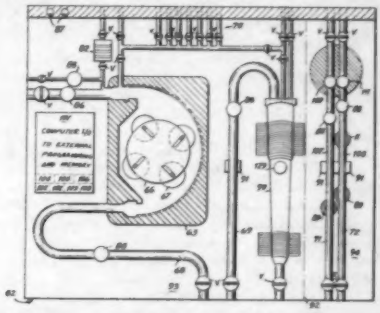
(2) second means responsive to said first means for converting said signal into a pressure measurement.

4,370,983

COMPUTER-CONTROL MEDICAL CARE SYSTEM

Eric S. Lichtenstein, 420 Taconic Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 915,672, Jun. 14, 1978, abandoned, which is a continuation of Ser. No. 670,608, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,738, Oct. 24, 1975, abandoned, which is a division of Ser. No. 494,006, Jul. 31, 1974, Pat. No. 3,946,731, which is a continuation-in-part of Ser. No. 395,214, Sep. 3, 1973, Pat. No. 3,912,455, which is a continuation-in-part of Ser. No. 108,118, Jan. 20, 1971, Pat. No. 3,774,762, and Ser. No. 157,942, Jun. 29, 1971. This application Apr. 30, 1979, Ser. No. 34,539
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—630 **64 Claims**



1. A computer-controlled medical care system suitable for carrying out any of a plurality of selected medical procedures in response to any of a plurality of selected programs, the term "medical procedures" being taken as inclusive of diagnostic and therapeutic procedures comprising:

computer means for receiving any of said plurality of programs, each of said programs being associated with a specific medical procedure;

at least one modular vessel structure, each modular vessel structure hereinafter termed "module";

support means for holding at least one said module, said module including first duct means for connecting with an individual and being arranged and constructed for cooperation with said support means for carrying out a selected procedure, said module including procedure-indicating means for indicating the specific procedure for which said module is designed;

and procedure-sensing and signalling means for sensing said specific procedure when said module is held in said support means for communicating the nature of said specific procedure to said computer means, said computer means being arranged and constructed for comparing said specific procedure with a selected program and for indicating whether said specific procedure and selected program correspond.

4,370,984

X-RAY TRANSPARENT MEDICAL ELECTRODE

James V. Cartmell, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Division of Ser. No. 34,394, Apr. 30, 1979, Pat. No. 4,257,424. This application Mar. 23, 1981, Ser. No. 246,874
The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—640 **6 Claims**

1. A medical electrode comprising:

an X-ray transparent conductor comprising a flexible, dimensionally stable, nonconductive plastic film, a layer of conductive silver paint adhered to one surface of said film and

having a first exposed conductive portion and a second exposed conductive portion spaced from said first exposed conductive portion, and further comprising a continuous insulating covering over said paint between said exposed portions;

a gel filled sponge engaging said first exposed conductive portion; and

means securing said conductor to said sponge.

4,370,985

MEDICAL MEASURING APPARATUS

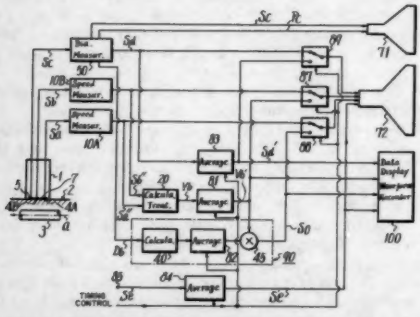
Hitoshi Takeichi, Kawasaki; Hiroshi Furuhata, Kasukabe; Ryoichi Kanno, Funabashi, all of Japan; Kuniyasu Kodaira, c/o Hayashi Denki Company Ltd., 2-7-11, Arima, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan; Mitio Ohno, and Hirozi Matumoto, both of Kawasaki, Japan, assignors to Kuniyasu Kodaira, Japan

Filed Apr. 21, 1980, Ser. No. 142,098

Claims priority, application Japan, Apr. 26, 1979, 54/51840

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 6 Claims



1. A medical measuring apparatus comprising: a probe adapted to be held in contact with a body surface of a patient adjacent a blood vessel, said probe having mounted therein to be in alignment with the blood vessel (a) an ultrasonic transmitting oscillating element inclined to be at an acute angle to the blood vessel (b), a pair of ultrasonic wave receiving oscillating elements arranged in front and rear of said transmitting oscillating element and inclined to be at acute angles to the blood vessel and (c), an ultrasonic wave transmitting and receiving oscillating element located at one side of one of said pair of receiving oscillating elements to be at right angles to said blood vessel, each of said ultrasonic transmitting oscillating element and said pair of ultrasonic wave receiving elements having a length at least equal to the diameter of said blood vessel;

first means for continuously driving said ultrasonic wave transmitting oscillating element to emit a continuous ultrasonic wave;

second means for intermittently driving said ultrasonic wave transmitting and receiving oscillating element to emit a pulsating ultrasonic wave;

said pair of receiving elements receiving a continuous ultrasonic wave reflected from the blood flow,

said transmitting and receiving oscillating element receiving a pulsating ultrasonic wave reflected from the blood vessel;

third means for receiving an output from said pair of receiving elements and generating a signal representing blood flow speed;

fourth means for receiving an output from said transmitting and receiving oscillating element and producing a signal output representing blood vessel diameter deviation and a pulse output having a width corresponding to the blood vessel diameter;

fifth means for producing a signal representing blood flow amount from the signals delivered from said third and fourth means;

sixth means for controlling said third and fourth means in response to an electrocardiogram output of the patient;

a first cathode ray tube for displaying the signals representing the blood flow speed, blood flow amount and blood vessel diameter deviation; and

a second cathode ray tube for displaying the signal representing the blood vessel diameter deviation output and also displaying the pulse output having the width corresponding to the blood vessel diameter.

4,370,986

METHOD AND APPARATUS FOR DETERMINING THE DEPOSITION OF PARTICLES IN THE RESPIRATORY TRACT AND/OR FOR CHECKING THE FUNCTION OF THE RESPIRATORY TRACT

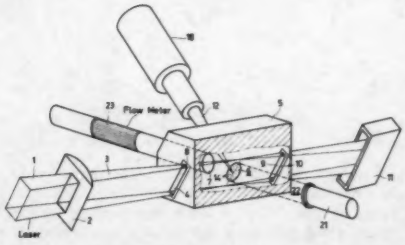
Josef Gebhart, Dietzenbach; Gerhard Heigwer, Offenbach; Joachim Heyder, Frankfurt am Main, and Willi Stahlhofen, Bad Homburg, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Strahlen-und Umweltforschung mbH München, Neuherberg, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,821

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938856

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—716 14 Claims



1. In a method for determining the deposition of particles in the respiratory tract or for checking the operating function of the respiratory tract of a test patient including injecting a pulse of a gas or aerosol into a stream of air to be inhaled by a test patient and obtaining a measuring signal in each of the inhaled and exhaled streams of the test patient; the improvement comprising: directly conducting the main stream of the inhaled and of the exhaled air through a band of light; placing the region of the intersection of the band of light with at least part of the inhaled and exhaled streams in the object plane of an optical image system of a light detecting device; and detecting the light radiation produced in said object plane by the inhaled and the exhaled streams to provide said measuring signal.

4,370,987

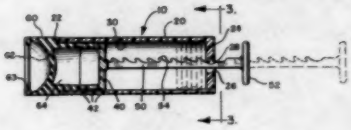
MEDICAL FLUID COLLECTION DEVICE

Seymour Bazell, 9235 N. Latrobe, Skokie, Ill. 60077, and Edward M. Goldberg, 225 Maple Hill Rd., Glencoe, Ill. 60022

Filed Oct. 7, 1980, Ser. No. 194,872

Int. Cl.³ A61B 5/14

U.S. Cl. 128—760 40 Claims



1. A medical fluid collection device comprising:

means for defining a fluid collection chamber;

means for manually generating a subatmospheric pressure in the chamber, said generating means comprising a handle mechanically secured to a portion of the chamber defining means to allow manual positioning of said portion with respect to the remainder of the chamber defining means by manipulation of the handle;

a pierceable diaphragm mounted to the chamber defining means such that a first side of the diaphragm is in fluid communication with the chamber; and

means for mechanically locking the portion of the chamber defining means in place with respect to the remainder of the chamber defining means to maintain subatmospheric pressure in the chamber.

4,370,988

CIGARETTE HOLDER SMOKE FILTERING CARTRIDGE WITH TWO STAGE SMOKE PURIFICATION ACTION

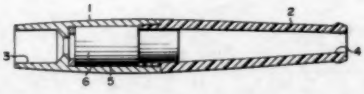
Masahiro Terasaki, 43, Okimiyacho, Edogawa-ku, Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,244

Claims priority, application Japan, Dec. 24, 1980, 55-187076[U]

Int. Cl.³ A24D 1/04

U.S. Cl. 131—201 13 Claims



1. For a cigarette holder comprising a cigarette receiving member formed with a smoke intake passage and adapted to receive a cigarette so as to supply the smoke from said cigarette to said smoke intake passage, and a mouthpiece member formed with a smoke outlet passage and adapted to be sucked by the mouth of a user, said cigarette receiving member and said mouthpiece member being selectively detachably joined together, and a cartridge receiving chamber being defined within said cigarette holder by the cooperation of said cigarette receiving member and said mouthpiece member when they are so joined together, said smoke intake passage and said smoke outlet passage communicating to opposite ends of said cartridge receiving chamber:

a cartridge, for being fitted into said cartridge receiving chamber and for purifying smoke sucked into said smoke intake passage and sucked out of said smoke outlet passage, thus passing through said cartridge receiving chamber, comprising:

(a) an outer shell, comprising: a first hollow tubular portion; a second hollow tubular portion, connected substantially coaxially with said first hollow tubular portion; a dividing wall portion, generally separating the interior space within said first hollow tubular portion from the interior space within said second hollow tubular portion, extending generally perpendicularly to the central axis of said first and second hollow tubular portions, and formed with a hole, said hole communicating said interior spaces within said first and second hollow tubular portions; and a tubular inner lip, which extends all around the periphery of said hole formed in said dividing wall, and which extends from said periphery of said hole formed in said dividing wall in the direction of said central axis of said first hollow tubular portion on the side of said dividing wall portion towards said first hollow tubular portion;

(b) a cup member, formed with a substantially cylindrical tubular side wall portion and a bottom portion, mounted within said first hollow tubular portion at a position therein remote from said dividing wall portion with the central axis of said substantially cylindrical tubular side wall portion thereof substantially in coincidence with said central axis of said first hollow tubular portion, and with the open end of said cup member facing away from said dividing wall; said cup member intercepting across said interior space within said first hollow tubular portion except for a set of one or more relatively narrow spaces defined between the outer wall surface of said cup member and the inner wall surface of said first hollow tubular portion, the parts of said relatively narrow spaces nearer said dividing wall portion being communicated to the interior space within said first hollow tubular portion between said cup member and said dividing wall portion; a set of one or more relatively small apertures being formed through said side wall portion of said cup member and communicating between said interior space within said cup member and said set of relatively narrow spaces;

(c) a disk member, mounted so as to extend completely across said interior space within said first hollow tubular portion on the side of said cup member remote from said dividing wall portion, and generally contacting, with its side which faces towards said cup member, the edge of said substantially tubular side wall portion of said cup member remote from said bottom thereof; a hole being formed through said disk member and communicating the space on the side of said disk member remote from said cup member with said interior space within said cup member; said space on said side of said disk member remote from said cup member being communicated with said interior space within said first hollow tubular portion between said cup member and said dividing wall portion only via, in the specified order: said hole formed through said disk member, said interior space within said cup member, said set of relatively small apertures formed through said side wall of said cup member, and said set of relatively narrow spaces defined between said side wall portion of said cup member and said inner wall of said first hollow tubular portion;

and

(d) a filter, mounted in said interior space within said second hollow tubular portion so as to intercept passage of smoke from said hole in said dividing wall portion towards the end of said second hollow tubular portion remote from said dividing wall portion.

4,370,989

APPLICATOR FOR LIQUID COSMETICS

Charles H. Taylor, 15 Beacon Hill Rd., West Springfield, Mass. 01089

Continuation of Ser. No. 823,744, Aug. 11, 1977, abandoned. This application Sep. 19, 1979, Ser. No. 77,093

Int. Cl.³ A45D 40/00

U.S. Cl. 132—79 B 4 Claims

1. A hand held applicator for applying a cosmetic preparation which comprises:

a hollow handle comprising enclosing, flexible walls defining an interior space containing a quantity of air, the walls having an interior surface facing toward the interior space

and an exterior surface facing away from the interior space, both the entire interior wall surface and exterior wall surface normally being exposed and contacted by air;

the handle walls being provided with an unobstructed hole therethrough, the hole communicating with the interior space to permit free passage of air into and out of the interior space;

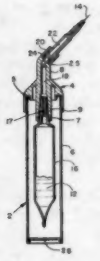
the handle walls being squeezable from a first position wherein no cosmetic preparation flows to a squeezed position wherein the cosmetic preparation flows from the applicator;

a wand operably connected to the handle, said wand having a cosmetic passage wherein the cosmetic preparation flows therethrough,

the wand being connected to the handle in in an air tight junction whereby air within the handle is completely separated from the cosmetic passage;

an applicator carried by the wand for applying the cosmetic preparation delivered through the cosmetic passage; and

a replaceable container positioned within the interior space and holding the cosmetic preparation, said container having flexible sidewalls and a cosmetic opening in fluid communication with the cosmetic passage, the cosmetic passage carrying the preparation from the container to the applicator,



the container sidewalls, the cosmetic opening and the cosmetic passage forming a fluid path that is entirely closed whereby the cosmetic preparation is always separated from the air within the handle,

the container sidewalls having a first, unsqueezed condition when the handle walls are in their first position, and a second squeezed condition when the handle walls are in their said squeezing position;

the handle walls being in direct contact with the container sidewalls when the handle walls are urged to the said squeezed position, to force a portion of the cosmetic preparation through the cosmetic opening and a portion of the air through the unobstructed hole,

the portion of the interior space not occupied by the container being filled with air, the air leaving the interior space through the said hole when the handle is squeezed to the squeezed position, the air entering through the hole and surrounding substantially the entire container when the handle is in its said first position,

the walls of the handle not being in contact with the sidewalls of the container when in the said first position;

whereby a hand held apparatus is provided which may be easily and simply used by one hand to apply the cosmetic preparation.

4,370,990

COIN COUNTING AND STOPPING APPARATUS FOR USE IN A COIN HANDLING MACHINE

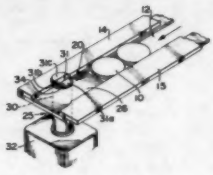
Kenkichi Watanabe, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,284

Claims priority, application Japan, Jun. 29, 1979, 54/89179[U]; Nov. 13, 1979, 54/146948; Dec. 25, 1979, 54/179750[U]

Int. Cl.³ G07D *9/00*

U.S. Cl. 133—8 A **6 Claims**



1. A coin counting and stopping apparatus for use in a coin handling machine wherein coins transferred in a coin path are counted one after another and stopped when a preset number of coins is counted which comprises:

at least one detector provided in the coin path for detecting the passage of the coins to generate signals;

a stopper rotatably mounted downstream of said detector and including a portion to be projected into the coin path so as to stop the coins when the stopper is rotated; and

means for rotating the stopper when the signals indicate that the preset number of coins are counted, said stopper being disposed so that its axis is perpendicular to the coin path and comprising a shaft formed at the top portion thereof with a cut-out.

4,370,991

DIP TREATING APPARATUS

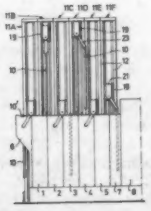
Sture S. Lindvall, Henrik Palmes Alle 18, Djursholm S-182 62, Sweden

Filed Jul. 15, 1981, Ser. No. 283,638

Claims priority, application Sweden, Aug. 14, 1980, 8005749

Int. Cl.³ B08B *3/04*

U.S. Cl. 134—76 **7 Claims**



1. A dip treating apparatus for carrying out a multiple-step process in which the objects to be treated have to remain for preselectable periods of time in a number of different treating baths, and for moving in succession at least partially uniform carriers of the objects to be treated through a plurality of stations arranged in a row, one after the other, at least two consecutive ones of said stations including containers for treatment baths, said apparatus comprising a plurality of conveyor means, each of which is adapted to serve two consecutive and adjacent ones of said stations only and is operative to transfer one carrier at a time in a predetermined direction between said two stations, each of said conveyor means comprising a vertical guideway arranged at one side only of the two stations to

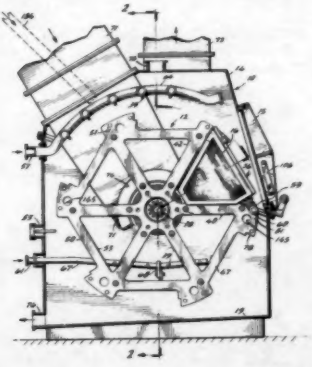
be served, a slide member reciprocatable along said vertical guideway, driving means for reciprocating said slide member between predetermined end positions, a rocker member mounted on said slide member and capable of oscillating relative thereto between two perative positions by rocking about a horizontal pivot axis extending in a direction across said row of stations, means for forcibly changing the operative position of said rocker member whenever said slide member during its reciprocating movement approaches its respective end positions, and catching means provided on said rocker member in a manner to move in the direction between the two stations served by the conveyor means when said rocker member is forced to change its operative position, said catching means being adapted to pick up the carrier to be transferred at a first one of said two stations at a first level and to deliver it at the second one of said two stations at a second level, wherein said horizontal pivot axis of said rocker member is positioned relative to the slide member in a manner to remain, throughout the entire vertical stroke of said slide member, above the levels at which the carrier is picked up, and delivered respectively, by said catching means of the rocker member, and wherein said catching means are arranged to move along a path below said pivot axis of the rocker member when the latter is forced to change its operative position.

4,370,992

WASHING APPARATUS FOR SMALL PARTS

Hrishikesh Choudhury, Gurnee, Ill., and Juergen H. Zaha, Moore, S.C., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 303,697
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—100 **12 Claims**



1. A washing apparatus for cleaning small component parts with a washing fluid comprising:

a carrier member;

a frame and housing member to enclose and support said carrier member in a rotatable manner on a horizontal axis;

means to rotate said carrier member;

a plurality of basket members carred by said carrier member;

said basket members defining a door member and at least one wall section formed of a material which will retain said parts therein but will allow said washing fluid to enter and exit therefrom;

nozzle means disposed inside said housing member and arranged to direct said washing fluid into said basket members at predetermined positions;

washing fluid conduit means connected to said nozzle means;

means defined by said housing member to drain said washing fluid from said housing at a position below said nozzle means;

said housing member defining an opening therein of a dimension which will permit said basket members to pass therethrough;

a closure member operatively associated with said housing to close said opening; and

means operatively associated with said basket member and said carrier member which will secure said basket member in one position within the confines of said carrier member and in another position will allow said basket members to be positioned through the opening in said housing to extend to the outside of said housing;

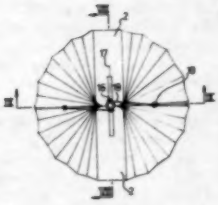
so that said basket members can be extended from said carrier member, through said opening to be disposed outside said housing member for loading of said component parts and subsequently moved back inside said housing for engagement with said carrier member.

4,370,993

DISPOSABLE UMBRELLA

Jean Desaleux, 181 Rue du Faubourg Saint-Honore, 75008 Paris, France, and Christian D'Artois, Paris, France, assignors to Jean Desaleux, Paris, France

Filed Jan. 21, 1981, Ser. No. 227,032
Claims priority, application France, Jan. 23, 1980, 80 01437
Int. Cl.³ A45B *13/00*
U.S. Cl. 135—19.5 **10 Claims**



1. A cheap umbrella for a limited number of utilizations of a type comprising a folded canopy, the opening and closure of which are achieved through parts acting as forks and which are hinged on a slide sliding along a handle, the said canopy being formed from a roughly rectangular blank provided with parallel fold lines, for alternate folding to the inside and the outside, bounding between them pleats of constant width except for the end edges which are narrower than this width, the assembly double folded in zig-zag shape being subsequently folded in two round a transverse mid-line so that the two halves of each end edge butt against each other and are fastened together by bonding or welding, characterized by the fact that the said blank comprises a centre rectangular area (2) located between two successive fold lines (3), both for folding to the inside, the width of which amounts to over twice the width of a standard pleat (5); and that the said parts acting as forks are formed by two flat vanes (18) in cardboard or similar material of half-oval shape hinging on the fastening and hinge pieces (16) of the slide (15) and also hinging in the said glued flanges (6), and through two tabs (20) hinging through two transverse grooves (21, 22) made in each of them and fixed by one of their ends into one of the said fastening and hinge pieces (16) of the slide (15) and by the other end on the inner face of the said centre rectangular panels (2).

4,370,994

INFLATABLE UMBRELLA AND METHOD OF FABRICATING THE SAME

Benny R. Pittman, P.O. Box 672, Rutherfordton, N.C. 28139

Filed Feb. 19, 1981, Ser. No. 235,955
Int. Cl.³ A45B *19/02*
U.S. Cl. 135—20 B **11 Claims**

1. An inflatable umbrella characterized by the ability to be collapsed and retained in the form of a small easily carried package when not in use, and to be rapidly inflated to an operative configuration by the breath of the user or the like, and comprising

a flexible plastic cover sheet having a generally circular outline,

a flexible plastic panel overlying one surface of said cover sheet and being sealably joined along its peripheral edge to said one surface to define an enclosed airspace therebetween,

an elongate flexible plastic tubular member having one end sealably joined to said panel and so that the interior of said tubular member is in fluid communication with said enclosed airspace,

valve means mounted for permitting air to be selectively blown into and released from the interior of said tubular member and said enclosed airspace, and

flexible bag means mounted at the other end of said tubular member, with said bag means being sized to receive and retain the cover sheet, panel and tubular member when collapsed,

whereby the umbrella may be inflated to an operative configuration by blowing air through said valve means and into said tubular member and enclosed airspace, and such that the resulting air pressure serves to rigidify the tubular member and support the cover sheet and panel in a generally open expanded configuration, and the umbrella may be collapsed by releasing the air through said valve means to permit the cover sheet, panel, and tubular member to be folded into said bag means.

4,370,995

METHOD AND APPARATUS FOR PRENOTCHING A PIPELINE

William B. Smith, Berea, Ohio, assignor to The Pipe Line Development Co., Cleveland, Ohio

Filed Jan. 2, 1981, Ser. No. 221,883
Int. Cl.³ F16L *55/00*; B23D *21/08*
U.S. Cl. 137—15 **10 Claims**

9. A method of prenotching a pipeline in service to facilitate penetration of the pipeline with a shear plate having a pair of cutting edges on its leading face at axially spaced planes, comprising the steps of:

securing a housing to the exterior of the pipeline capable of containing pressurized fluid existing in the pipeline and providing on the housing at least one axially extending access opening,

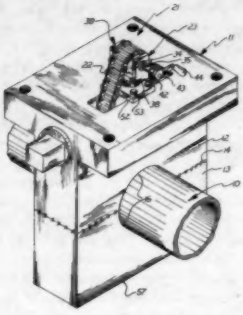
supporting an external removable operator including a sprocket wheel on the housing at the access opening with its axis parallel to the axis of the pipeline,

circumferentially wrapping the section of pipeline enclosed by the housing and the sprocket with an endless loop of power transmission type chain,

providing axially spaced cutting wheels on the chain with cutting edges projecting radially inward of the chain,

tensioning the chain to force the cutting wheels against the circumference of the pipeline section, and

with the housing previously secured to the pipeline, moving the chain relative to the wall of the pipeline section in a



circumferential direction by the operator to cause said cutting wheels to cut into but not through the wall of the pipeline in a chipless manner, and

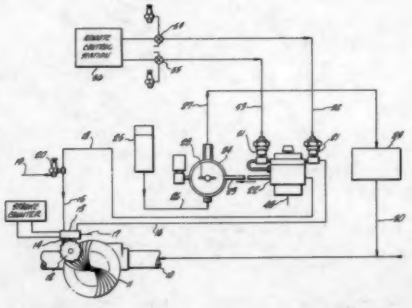
removing the chain and cutting wheels from the pipe section to provide clearance for subsequent operation of the shear plate through said at least one access opening.

4,370,996

FLOW-CONTROLLED INJECTOR SYSTEM

James F. Williams, 25217 Rye Canyon Rd., Valencia, Calif. 91355

Filed Mar. 13, 1981, Ser. No. 243,371
Int. Cl.³ G05D *11/00*
U.S. Cl. 137—99 **11 Claims**



1. In a chemical injection system for use on fluid pipeline comprising, a meter measuring fluid flow through the pipeline, an air-operated injection pump means for connecting to the pipeline for injecting predetermined amounts of chemicals into the pipeline upon each stroke, a supply of pressurized air, a controller means operatively connected to said pump means, a valve means associated with said meter for supplying first pulses of pressurized air to the controller means proportional in rapidity to the fluid flow measured by the meter, and the controller means supplying separate and controlled second pulses of pressurized air to the pump means in response to and in sequence with the first air pulses from the valve means for operating the pump means in like sequence and further in which said controller includes an adjustable control valve and port means to permit said controller to cycle automatically at

adjustable rates and second valve means for selectively isolating said adjustable control valve and operating the controller by air pulses from said meter-associated valve means or isolating said meter-associated valve means and operating the controller by said adjustable control valve and port means.

4,370,997

PRESSURE REGULATOR AND SAFETY VALVE ASSEMBLY

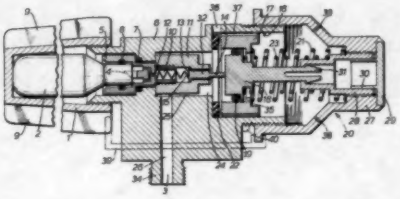
John D. Braithwaite, Maidenhead; Derrick O. King, Old Windsor, and Sidney J. Williams, Virginia Water, all of England, assignors to Black & Decker Inc., Newark, Del.

Filed Dec. 31, 1980, Ser. No. 221,901

Claims priority, application United Kingdom, Jan. 3, 1980, 8000177

Int. Cl.³ G05D *11/00*

U.S. Cl. 137—116.3 **3 Claims**



1. A pressure regulator and safety valve assembly, comprising:

a body having a chamber therein with an inlet and an outlet, and said body having a bore therein in communication with said chamber;

pressure regulating means, associated with said inlet, for regulating the pressure in said chamber;

a safety valve member mounted for movement relative to a static surface in said body between a closed position in which the safety valve member seals against the static surface and an open position in which the safety valve member is spaced from the static surface and vents said chamber externally of said body;

said safety valve member being slidably received in said bore and having a face in communication with said chamber, and said safety valve member being annular with a shoulder;

a first spring resiliently urging said safety valve member against said static surface whereby when the pressure in said chamber acting upon said face overcomes the bias force of said first spring said safety valve member is lifted off said static surface to vent said chamber to atmosphere;

said pressure regulating means comprising a piston slidably and sealingly received within said safety valve member, and a second spring resiliently urging said piston towards said chamber;

a control member movably mounted on said body and operatively connected to said pressure regulating means for normally turning said pressure regulating means on and off, and for readily adjusting the setting thereof during normal use of the assembly;

said control member also being operatively connected to said safety valve member whereby normal adjusting of said pressure regulating means by said control member simultaneously changes the setting of the safety valve member in dependence upon the setting of the pressure regulating means;

said piston having an anchor extending therefrom which is engaged by said control member to positively withdraw said piston away from said chamber when said control member is moved to the "off" position; and

said piston engaging said shoulder to positively lift said safety valve member away from said static surface when said control member is moved to the "off" position.

4,370,998

FUEL TANK FOR RESERVING DIFFERENT KINDS OF FUELS

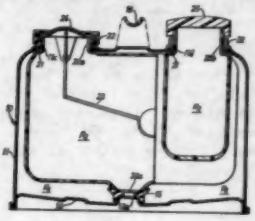
Akiyoshi Kimpara, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Dec. 29, 1980, Ser. No. 221,051

Claims priority, application Japan, Jan. 10, 1980, 55-2343

Int. Cl.³ B65D *25/18*; F17C *3/00*

U.S. Cl. 137—264 **4 Claims**



1. A fuel tank for containing and separately reserving a plurality of fuels comprising:

an outer casing comprising a body having a top wall with a first opening, a second opening, and a third opening therethrough, a side wall and a bottom opening, said top wall and side wall forming a first fuel-receiving cavity, and a bottom member sealingly attached to the perimeter of said bottom opening so as to close said cavity;

an inner casing having a continuous wall to form a second fuel-receiving cavity, and two necks, each forming an opening passing through a respective one of said openings;

said inner casing having been placed in said cavity of said outer casing prior to attachment of said bottom member to said outer casing, a space being provided between the inner and outer casings to define said first fluid-receiving cavity, said first opening communicating with said first cavity;

seal and fastener means fixing and hermetically sealing said necks to said openings;

closure means for each of said openings, the closure for said first opening, and for at least one of said second and third openings being removable to give access to a respective cavity;

there being a spacing between said bottom member and the bottom of said inner casing, and an elastomeric support member resting on said bottom member and supporting and centering said inner casing.

4,370,999

PRESSURE LIMITING DEVICE WITH TWO PRESSURE LEVELS FOR A PRESSURE COOKER

Christian Sebillotte, Selongey, France, assignor to SEB S.A., Selongey, France

PCT No. PCT/FR80/00068, § 371 Date Dec. 22, 1980, § 102(e) Date Dec. 22, 1980, PCT Pub. No. WO80/02496, PCT Pub. Date Nov. 27, 1980

PCT Filed Apr. 30, 1980, Ser. No. 227,100

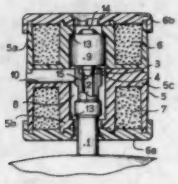
Claims priority, application France, May 11, 1979, 79 12028

Int. Cl.³ F16K *17/12*

U.S. Cl. 137—270 **8 Claims**

1. A device for limiting the pressure to at least two pressure levels for a steam pressure-cooker, the said device comprising a steam escape duct terminating externally in a valve seat surrounding the duct opening, a cap which has an axial cavity adapted to accommodate the escape duct and connected to the

outside by two substantially tangential vents, wherein the cap is adapted to slide upon the steam escape duct and may be at will turned over with respect to the steam escape duct, and a valve slidable in the axial cavity and provided at its ends with coaxial differently designed shut-off surfaces adapted to bear



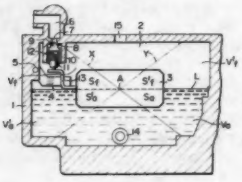
upon the seat in order to shut off the duct with different shut-off cross sections, the cap comprising, at each end, stops designed to apply the weight of the cap to the shut-off surface in such a manner that the center of gravity of the cap is located below the contact between the shut-off surface and the seat thereof.

4,371,000

ANTI SURGE FLOAT CHAMBER ASSEMBLY

Kazuo Shinoda; Keizo Higashigawa, and Ken Shiozawa, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 19, 1980, Ser. No. 188,831
Claims priority, application Japan, Feb. 15, 1980, 55-17394
Int. Cl.³ F16K *31/18, 33/00;* **F02M** *5/02*
U.S. Cl. 137—434 **1 Claim**



1. A float chamber assembly for controlling the supply of a fluid, comprising:

a body within which are defined a float chamber which provides an effective liquid containing chamber space, a fluid inlet passage opening into the float chamber for supplying the fluid into the float chamber, and a fluid outlet passage opening into a lower part of the float chamber for taking the fluid out from the float chamber;

a float within the float chamber;

means to enable the buoyancy force exerted on the float to be independent of the angle of tilting of the float chamber, said means comprising the shape of the float and the float chamber being such that they have each a common point and when a line including said common point is rotated around said point within a substantial angle such as 90 degrees, said line will traverse the same area on opposite sides of said point with respect to both the float and the effective liquid containing chamber space when viewed in a longitudinal cross section;

the float being supported to be movable up and down in the float chamber with one degree of freedom so that at one position of its movement, said common point on the float coincides with the fluid level of the float chamber;

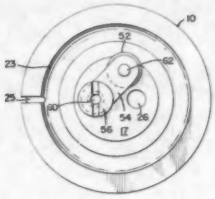
and a fluid valve for controlling fluid flow through the fluid inlet passage, which is connected to the float so as to be closed when the float rises up to a position where said common point of the float coincides with that of said float chamber, with the level of fluid in said float chamber being at the level of said common point.

4,371,001

CHECK VALVE ASSEMBLY

John H. Olsen, Vashon, Wash., assignor to Flow Industries, Inc., Kent, Wash.

Continuation of Ser. No. 847,105, Oct. 31, 1977, abandoned.
This application Mar. 10, 1980, Ser. No. 128,553
Int. Cl.³ F16K *15/00;* **F04B** *39/10*
U.S. Cl. 137—512.3 **12 Claims**



8. A check valve assembly, comprising:

a valve body, said valve body including an inlet passage therein, a valve seat associated with said inlet passage, and an outlet passage:

a disc-shaped sealing member adjacent said valve seat for sealing said inlet passage to prevent pressurized fluid from flowing into said inlet passage;

a leaf spring having first and second ends, said first end connected to said disc-shaped sealing member; and

connector means connecting said second end of said leaf spring to said valve body, said connector means being threaded into said outlet passage and having a passage therethrough for permitting fluid to pass into said outlet passage, said connector means and said leaf spring cooperating to bias said disc-shaped sealing member against said valve seat for preventing fluid backflow into said inlet passage.

4,371,002

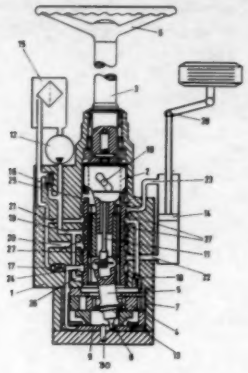
HYDROSTATIC STEERING SYSTEM

Werner Tischer, Bobingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,674
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1979, 2904111
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—625.3 **2 Claims**

1. In a hydrostatic mechanism having a valve piston (2), a housing (1) mounting the valve piston for axial and rotational displacement, said housing and valve piston being provided with confronting annular grooves enclosing an annular space, a passage bridging cavity (27) formed in the housing and extending from opposite sides of the annular grooves to form valve passages through which flow of pressurized fluid to and from said annular space is conducted with a predetermined flow control, the improvement residing in precisely dimensioned means for limiting said valve passages to circumferentially spaced locations about the valve piston at said groove (32) therein while maintaining said predetermined flow con-

trol, said precisely dimensioned means comprising recesses (28) provided on both of the axial sides of the cavity, the



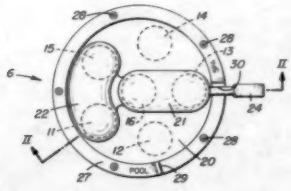
recesses on the respective axial sides being angularly spaced from each other about the periphery of the valve piston.

4,371,003

SWIMMING POOL/SPA SELECTOR VALVE

Robert P. Goguen, 350 Laurelwood Rd., Santa Clara, Calif. 95050

Filed Jan. 19, 1981, Ser. No. 226,071
Int. Cl.³ F16K *11/06*
U.S. Cl. 137—625.46 **6 Claims**



1. A valve for concurrently shifting two independent flows of fluid, comprising:

(a) a generally cylindrical valve body having a flat end wall on which are located two constant flow ports A,B and four determinable flow ports C,D,E and F, said ports being aligned for connection to six parallel and adjacent fluid conduits;

(b) first and second positionable conduits movable relative to the valve body between a first position and a second position, in said first position said first conduit connects constant flow port A with determinable flow port C and said second conduit connects constant flow port B with determinable flow port E and in said second position said first conduit connects constant flow port A with determinable flow port D and said second conduit connects constant flow port B with determinable port F; and

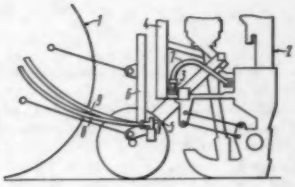
(c) selector means, connecting the valve body and the conduits together, for coacurrently moving the first and second conduits relative to the valve body between the first position and the second position.

4,371,004

AUTOMATIC COUPLING DEVICE TO CONNECT TRACTOR AND TRACTOR-DRAWN MEANS HYDRAULIC SYSTEMS

Petr V. Sysolin, prospekt Pravdy, 60, kv. 25; Ivan I. Zaitsev, prospekt Pravdy, 6, kv. 12; Gary M. Pekerman, ulitsa Uflmskaya, 15, kv. 71; Jury P. Kurzov, prospekt Pravdy, 3, kv. 31; Alexandr E. Tompakov, ulitsa 50 let Oktyabrya, 11, kv. 35; Valery A. Maljuchenkov, ulitsa Volkova, 18, kv. 90, and Alexandr S. Kabachenko, pereulok Spusknoi, 12, all of Kirovograd, U.S.S.R.

Filed Sep. 17, 1980, Ser. No. 187,993
Int. Cl.³ F16L *37/28*
U.S. Cl. 137—899 **4 Claims**



1. An automatic coupling device for connecting a hydraulic system of a tractor and a hydraulic system of a tractor-drawn device comprising:

a panel secured on said tractor-drawn device;

receiving unions accommodated in said panel and connected with said hydraulic system of said tractor-drawn device;

first shut-off valves built into said receiving unions for controlling fluid flow through said receiving unions;

a body secured on said tractor;

hollow plungers movably mounted in blind bores in said body, the number of said plungers being equal to that of said receiving unions and said plungers having first end faces movable into positions operatively engaging said receiving unions;

second shut-off valves disposed in the plungers at the first end faces operatively engaging said unions;

bottom chambers defined by said hollow plungers in each of said bores, said bottom chambers intercommunicating with each other;

a pressure port provided in the body for connection to the tractor hydraulic system;

a branch provided in said body and extending from said pressure port to said bottom chambers for furnishing fluid under pressure to said bottom chambers, such fluid moving said hollow plungers with respect to said body so that said first end faces enter said receiving unions and said second shut-off valves engage said first shut-off valves whereby said shut-off valves are moved to establish fluid communication between said receiving unions and said plungers;

a drain port provided in said body for connection to said hydraulic system of said tractor; and

apertures provided in the side wall of each of said plungers at the end faces opposite to those operatively engaging said unions for communicating the hollows of said plungers with respective ones of said pressure and said drain ports.

4,371,005

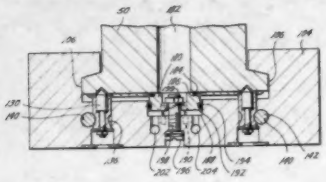
PROTECTIVE COVER FOR UNDERWATER FLOW LINE HUB

Charles D. Morrill, Bellaire, Tex., and Michael J. A. Best, Dursley, England, assignors to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 973,895, Dec. 28, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 98,965

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—89 **13 Claims**



1. A temporary cover for a hub, the hub having an outwardly extending end flange with a front sealing face, comprising:

a body member having one end adapted to enclose the hub, said body member having a blind cavity of substantially U-shape in said one end with the opening of the U extending through the top of the body member, said cavity having an outer portion shaped correlatively to the hub portion adjacent the flange end and an enlarged groove at its inner end shaped correlatively to such flange,

means disposed substantially inside said body member for releasably lockingly engaging such sealing face of said hub, said engaging means including a first reciprocable member movable between a first position in engagement with, and a second position released from, such sealing face of said hub, and a second reciprocable member movable between a latched position in engagement with said first member and retaining said first member in said first position, and an unlatched position released from said first member, and

a trigger mechanism operable to move said second member from its latched to its unlatched position to release said second member from said first member, said first member including camming means thereon cooperable with a correlatively shaped portion of such sealing face for moving said first member to its second position out of engagement with said hub when said second member is in said unlatched position upon applying a downward force to said cover, whereby said cover is released from said hub.

4,371,006

READING AND CONTROL DEVICE FOR A CONTROL MACHINE

Rudolf Schwarz, Horgen-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

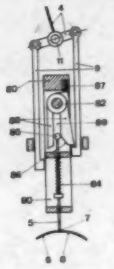
Filed Feb. 19, 1981, Ser. No. 236,824

Claims priority, application Switzerland, Feb. 22, 1980, 1417/80

Int. Cl.³ D03C *1/00*

U.S. Cl. 139—68 **4 Claims**

1. In a reading and control device for a control machine which is controlled by a pattern card having nonperforated points and holes, has a reading needle for reading the pattern card, and has a force amplifying bar movable in the direction of movement of the reading needle relative to a control part, the reading needle being movably supported in the force amplifying bar to project against the pattern card and being in active engagement with a lock member which is pivotally supported on the force amplifying bar for movement between two positions, a portion of the lock member in each such position being in the path of movement of control parts of the control device, the improvement comprising wherein the lock member is a lever having two arms which extend almost parallel to one another to form together a slot in which the head of the reading needle engages; wherein the inner surface of one arm is inclined near its free end and forms a sliding surface for the head of the reading needle; wherein between the lock member and force amplifying bar there is arranged a spring, which



facilitates an urging of the inclined sliding surface of the one arm against the head of the reading needle; and wherein the two ends of the lock member during their outermost swings each reach beyond the force amplifying bar and into the path of movement of an offset portion of a respective draw arm for a correcting element of the control mechanism.

4,371,007

PICKING METHOD AND APPARATUS ON TEXTILE LOOMS INVOLVING THE USE OF A FLUID MEDIUM

Walter Scheffel, Hopfenstrasse 14, Weissenburg/Bayern, Fed. Rep. of Germany

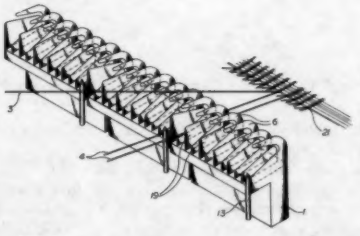
PCT No. PCT/CH79/00087, § 371 Date Feb. 12, 1980, § 102(e) Date Feb. 12, 1980, PCT Pub. No. W080/00087, PCT Pub. Date Jan. 24, 1980

PCT Filed Jun. 12, 1979, Ser. No. 191,241

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825679

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **4 Claims**



1. In an apparatus for the fluid insertion of the weft in a loom which comprises a swingable sley extending across the loom and carrying a reed for the battening of a weft inserted into a warp shed formed by warp threads extending through said reed transversely to said sley and wherein said sley is formed with a weft channel extending across said loom and swingable into a warp shed formed by separating lower warp threads from upper warp threads, said channel being provided with a plurality of nozzles at spaced locations across the loom and oriented to carry a weft pick through said channel in said shed, the improvement wherein said channel is formed by a plurality of flat first yarn guides extending between said warp yarns and of generally V-shaped profile opening toward said reed with

upper flanks defining the upper side of said channel, rear flanks defining the rear of said channel and lower flanks, and second flat guides extending between the lower warp threads and spaced apart between said first guides, said second guides having upper edges disposed below said upper flanks and at least in part defining a bottom of said channel whereby the first guides pass through the warp at different positions from said second guides, said lower flanks being inclined downwardly toward said reed below said upper edges of said second guides.

4,371,008

GRIPPER HEAD FOR LOOMS WORKING WITH REMOVAL OF THE FILLING THREAD FROM STATIONARY BOBBINS

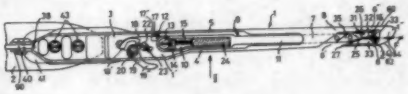
Erhard Freisler, Bubikon, Switzerland, assignor to Rüti Machinery Works Ltd., Rüti, Switzerland

Filed Aug. 18, 1980, Ser. No. 179,106

Claims priority, application Switzerland, Sep. 5, 1979, 8029/79

Int. Cl.³ D03D *47/20*

U.S. Cl. 139—348 **7 Claims**



1. A gripper head for a loom for removal of a filling thread from stationary bobbins, comprising:

means defining a clamping gap for fixedly clamping a filling thread which passes through the clamping gap essentially perpendicular to a central plane of warp threads;

said means defining said clamping gap comprising a fixed stop means and a movable clamping tongue;

means for displaceably mounting said clamping tongue for movement in the lengthwise direction of the gripper head in order to open and close said clamping gap;

means defining an internal space in said gripper head;

said clamping tongue being arranged in said internal space of said gripper head and having an elongated configuration;

said gripper head having a tip portion;

said tip portion running out into a flat hook having a mouth;

said clamping gap being formed by an inner edge of said mouth and a related lengthwise edge of the clamping tongue; and

said inner edge of said mouth of said hook forming said clamping gap and the related lengthwise edge of the clamping tongue each are provided with a respective step portion.

4,371,009

WEFT YARN ACCUMULATOR

Dionizy Simson, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 16, 1981, Ser. No. 243,761

Claims priority, application Switzerland, Mar. 28, 1980, 2447/80

Int. Cl.³ D03D *47/34*

U.S. Cl. 139—452 **9 Claims**

1. A weft yarn accumulator for weaving machines in mixed weaving, said accumulator comprising

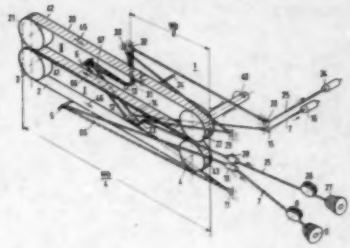
a pair of endless belts for forming respective yarn stores, each belt having a pair of yarn entraining members mounted thereon for forming yarn loops in a respective store;

said entraining members of each belt being spaced one-quarter of the belt length apart from one another on opposite sides of said belt and being staggered one-half of said belt length from one belt to the other belt;

a first and a second yarn guide located on the side where a yarn enters a respective store and disposed on the side of one of said entraining members of one belt;

a third, fourth and fifth yarn guide disposed centrally between the reversing points of said belt of one store and on the side of the other entraining member of said belt;

said third and fourth yarn guide being the base vertices of the resulting triangle, the free end of a yarn passing consecutively around said entraining member on said one side of the belt, through said first yarn guide and said third yarn guide, around said entraining member on said other



side of said belt, through said fifth yarn guide, again around said last-mentioned entraining member and through said fourth yarn guide to a shed;

a sixth, seventh and eighth yarn guide disposed centrally between the reversing points of said belt of the second store and on the last-mentioned side of said belt;

said seventh and eight yarn guides being the base vertices of the resulting triangle; and

a free part of the other yarn passing consecutively around said last-mentioned entraining member, through said second, seventh, sixth and eighth yarn guide to the shed.

4,371,010

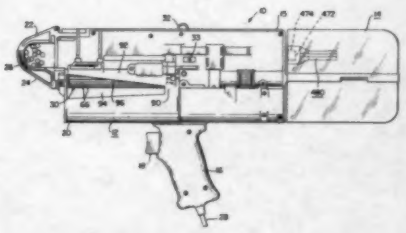
BUNDLING TIE APPLYING TOOL

Laszlo Hidassy, Jamesburg, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Nov. 3, 1980, Ser. No. 203,687

Int. Cl.³ B21F *9/02*

U.S. Cl. 140—93 A **50 Claims**



1. Apparatus for applying to a plurality of articles to be bundled an elongate, flexible bundling tie having a head and a strap portion from a succession of such bundling ties interconnected between adjacent heads by a web, comprising:

a housing;

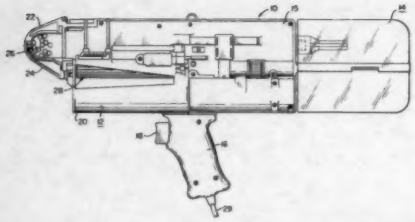
means supported in said housing for receiving said interconnected ties individually from said succession of bundling ties;

means for advancing said ties from said receiving means to a separating station;

means at said separating station for cutting the web between said tie heads to thereby provide separated, individual ties;

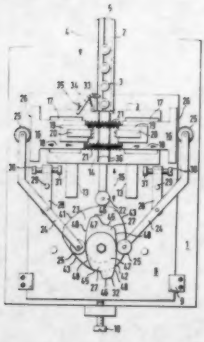
means for positioning an individual tie in a closed loop about said articles to be bundled; and
means for tensioning said tie about said articles.

4,371,011
ROTARY TIE CARRIER IN A BUNDLING TIE APPLYING TOOL
Laszlo Hidassy, Jamesburg, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Nov. 3, 1980, Ser. No. 203,694
Int. Cl.³ B21F *9/02*
U.S. Cl. 140—93.2 9 Claims



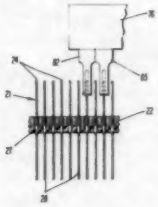
1. In a bundling tie applying tool, tie carrying apparatus for advancing a tie positioned thereon within said tool comprising a rotatable tie carrier supported for rotation about an axis within said tool and means on said tie carrier for holding said tie thereon in a position aligned with such axis during rotation of said tie carrier.

4,371,012
APPARATUS FOR WORKING LEADS OF ELECTRICAL COMPONENTS
Thomas Weresch, Greschbachstr. 19, D-7500 Karlsruhe 41, Fed. Rep. of Germany
Filed Nov. 6, 1980, Ser. No. 204,513
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944684
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—105 17 Claims



1. In an apparatus for working leads of electrical components having an inlet unit with a guideway and fixedly supported on a base-plate, two tools designed for operation with said inlet unit and powered by a driving motor, the tools each being positioned on a different one of two tool supports so that they may be moved towards each other for bending and kinking the leads of the said components between them, the leads running into the working path of the tools, which are supported on a carriage designed for a backward and forward working motion, parallel to the inlet unit's guideway and which are able to be moved towards each other for shutting in a direction normal to the inlet direction of the components and in timed relation to the working motion of said carriage, the invention residing in that
each tool support has a guide face generally parallel to said working motion of said carriage, the length of the guide faces being at least equal to the size of the working motion, the apparatus further having two levers, turningly supported on said base-plate, each one of these levers running against a different one of said guide faces, and
at least one shutting cam designed to be turned by said motor for moving said levers.

4,371,013
METHODS OF STRAIGHTENING BACKPLANE-SUPPORTED PINS
Carey A. Camp, Richmond, Va., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Aug. 29, 1980, Ser. No. 182,731
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—147 7 Claims

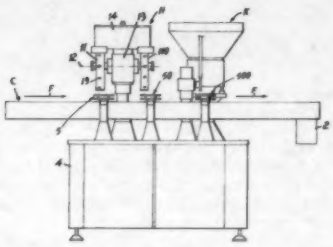


1. A method of straightening pins supported in equally spaced rows in a pin-populated backplane, which comprises the steps of:
mounting spatially at least two straightening bars in a parallel relationship with a spacing at least equal to the distance between the spacing of alternate rows of pins;
capturing simultaneously tips of the pins of alternate rows within respective ones of the straightening bars during a straightening cycle;
processing the straightening bars and the captured rows of pins whereby a first of the two straightening bars provides a single straightening cycle for each of the rows of pins and a second of the two straightening bars provides a single straightening cycle for each of the rows of pins;
wherein after the straightening of each of the rows of pins by each of the bars and while the pins remain captured by each of the bars, the method further comprises the step of bending each of the captured rows of pins slightly toward the next adjacent row of pins to be straightened; and
wherein during the straightening of the next adjacent row of pins by each of the bars, the method further comprises the step of moving the exterior side wall of each of the bars which is adjacent to the bent pins into engagement with the bent pins to facilitate the straightening thereof.

4,371,014
APPARATUS FOR DOSING AND DISPENSING A PREDETERMINED VOLUME OF POWDERED MATERIAL
Alessandro Cane, Bologna, Italy, assignor to Zanasi Nigris S.p.A., Bologna, Italy
Filed Oct. 31, 1980, Ser. No. 202,660
Claims priority, application Italy, Oct. 31, 1979, 15300/79[U]
Int. Cl.³ B67B *1/04*
U.S. Cl. 141—91 6 Claims

1. Apparatus for dosing and dispensing a predetermined

volume of powdered material into containers moving sequentially along a rectilinear guide path, comprising supply tank means for containing said powdered material; a plurality of rotary doser-dispenser units mounted on a single shaft defining a common rotational axis of said units, said rotational axis being substantially parallel to the rectilinear path along which the containers move, each unit including a plurality of open-ended radial chambers being sequentially inserted into the powdered material contained in the supply tank means during rotation of each said unit about said rotational axis, suction means operatively connected to said chambers for filling the chambers with the powdered material, said chambers being



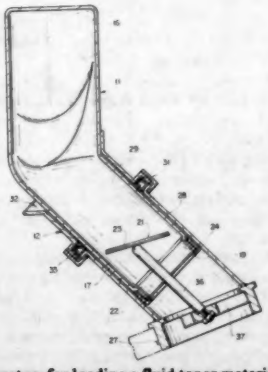
further sequentially movable into axial alignment with a receiving open end of the containers, pneumatic pressure means being applied to said chamber for discharging the powdered material from each chamber into the respectively aligned container; conveyor means defining said rectilinear guide path for moving each said container into successive alignment with a chamber in at least two said units; and means for intercepting and stopping said container in successive alignment with the corresponding chamber of said units to thereby enable the powdered material in the chamber of said two units being discharged into the container to increase the dosage of material in the container.

4,371,015

TONER LOADING SYSTEM HAVING CARTRIDGE WITH DISPLACEABLE DIAPHRAGM

Peter B. Simons, Los Altos, Calif., assignor to TBS, Inc., Mountain View, Calif.

Filed Dec. 24, 1980, Ser. No. 219,962
Int. Cl.³ B65B *1/06*; B67B *7/24*
U.S. Cl. 141—352 **6 Claims**



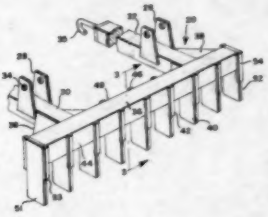
1. In a system for loading a fluid toner material into the toner hopper of a machine: a cartridge containing the toner material having a discharge opening sealed by a displaceable diaphragm of non-rupturable material, said diaphragm being larger than the discharge opening and free of attachment to said cartridge but, in a sealing position, extending across and closing said opening and having a peripheral edge portion sealingly but releasably engaging said cartridge inwardly of said discharge opening, a filler neck mounted on the machine in fluid communication with the toner hopper for receiving the toner cartridge, and means entirely within and eccentric to the filler neck for engagement with the diaphragm to dislodge and tilt said diaphragm from its sealing position to open the discharge opening and permit the passage of toner material from the cartridge to the machine when the cartridge is inserted into the filler neck.

4,371,016

DELIMBING APPARATUS

Jack E. Bradshaw, Rte. 3, Box 184A, Wallace, N.C. 28466

Filed Mar. 11, 1981, Ser. No. 242,618
Int. Cl.³ B27L *1/00*
U.S. Cl. 144—2 Z **12 Claims**



1. A vehicle delimbing apparatus for delimbing trees including:

(a) a frame having a top, a bottom, a front and a back;

(b) a plurality of delimbing arms projecting from the bottom of said frame;

(c) support braces secured to the front and back of said frame generally parallel to said delimbing arms extending partially along the length of said arms and being securedly affixed to said frame and said arms,

(d) whereby said delimbing arms are restrained from movement when said delimbing apparatus is operated by being moved along the longitudinal length of felled trees; and,

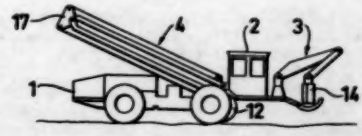
(e) attachment means for attaching said delimbing apparatus to a vehicle.

4,371,017

FOREST THINNING DEVICE

Karl T. Lindblom, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Sep. 26, 1980, Ser. No. 191,813
Claims priority, application Sweden, Oct. 8, 1979, 7908312
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—3 D **7 Claims**



1. A forest thinning device for forest working vehicles comprising a base vehicle, an operator's cabin, a crane having an arm pivotable at one end vertically and laterally, a felling and

gripping aggregate pivotably carried by the other end of said arm, said arm and said aggregate being operable from the cabin by control units therein, an extendable and vertically movable boom arrangement, one end of which is mounted on the vehicle for rotation around a vertical axis, and the other end of which carries both said cabin and said crane, the boom arrangement also being retractable and extendable from the cabin by control units therein to enable movement of said cabin and crane from a retracted resting position on the vehicle, used during the transport of the same, to an extended position spaced from the vehicle.

4,371,018

DEVICE FOR REPAIRING POLES FOR SUPPORTING ELECTRIC POWER TRANSMISSION LINES AND THE LIKE

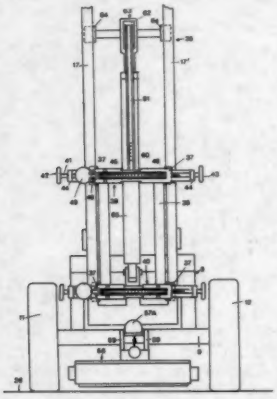
Victor Arnold, 3 Fairfax St., Mosman, New South Wales, 2088, Australia

Filed Sep. 17, 1980, Ser. No. 187,994

Claims priority, application Australia, May 26, 1980, PE03723

Int. Cl.³ B27C 9/00

U.S. Cl. 144—4 **2 Claims**



1. An apparatus for repairing a pole used to support a line comprising:

a base frame;

guide means carried by said base frame positionable in a substantially vertical position adjacent a pole to be repaired;

a movable carriage guided by said guide means;

clamp means carried by said carriage for clamping the pole;

means for moving said carriage with respect to said base frame so that the clamped pole is raised and lowered with respect to the base frame; and

cutting means carried by said base frame for sizing a lower end portion of a raised pole.

4,371,019

MOBILE LOG SPLITTING APPARATUS

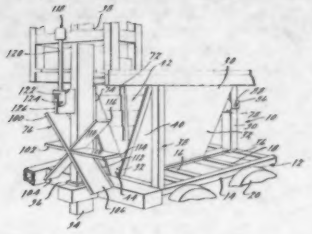
Michael J. Jeffrey, 1430 Stewart Rd., Hudson, Mich. 49427

Filed Aug. 25, 1980, Ser. No. 180,518

Int. Cl.³ B27L 7/00

U.S. Cl. 144—193 A **23 Claims**

17. A self-contained, mobile log splitting apparatus comprising, in combination, a framework, a guide chute supported by said framework and defining a generally V-shaped passageway open at each end and at the top thereof, a drive member mounted for reciprocal movement in the passageway defined by said chute, said drive member being of stepped configuration and of progressively decreasing thickness in a direction toward the apex of said chute, a log splitting head supported by said framework adjacent one end of said chute, said splitting head having a plurality of log splitting wedges directed toward said one end of said chute, hydraulic ram means operable to advance and retract said drive member in the passageway



defined by said chute, a hydraulic pump mounted on said framework and operatively connected to said hydraulic ram means, an internal combustion engine mounted on said framework and powering said hydraulic pump, and wheel means supporting said framework.

4,371,020

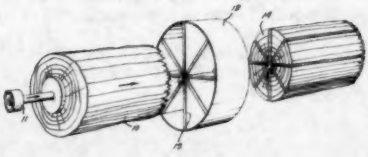
THREE-STEP PROCESS FOR PREPARATION OF LONG WOOD STRANDS

Derek Barnes, Vancouver; Mark T. Churchland; Arnold W. Herndier, both of Burnaby; Walter W. Schilling, Delta, and James K. Welsh, Burnaby, all of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 142,748, Apr. 22, 1980, abandoned, which is a continuation of Ser. No. 885,986, Mar. 13, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,190

Int. Cl.³ B27L 7/00

U.S. Cl. 144—366 **6 Claims**



1. The method of splitting a log into longitudinal grain wood strands comprising the steps of,

radially splitting the log substantially along the grain of the log into a plurality of sector shaped segments, said radial splitting including pushing the log axially through at least one sector splitter ring,

parallel splitting each of the sector shaped segments along the grain of the segments into a plurality of substantially parallel slabs, said parallel splitting including pushing each of the segments through a plurality of spaced apart splitting blades, and

further splitting each of the parallel slabs substantially along the grain of the slabs, said further splitting including feeding each of the parallel slabs through two rows of intermeshing counter rotating parallel discs, pulling each of the slabs between the rows of discs and simultaneously splitting each of the slabs into a plurality of discrete longitudinal-grain strands whose surfaces generally follow the grain in the wood throughout their length.

4,371,021

BOX TOP OPENER

Gregg A. Converse, and Maurice Converse, both of 1311 Briarhill Dr., Akron, Ohio 44313

Filed Sep. 23, 1980, Ser. No. 189,882
Int. Cl.³ B67B *7/00*
U.S. Cl. 145—21 **2 Claims**

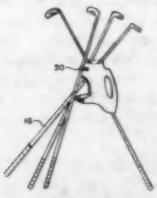
1. A box top opener comprising elongated handle means, flat plate means secured to and extending transversely to the length of said handle means at one end thereof, first and second flat, parallel, closely spaced apart jaws extending perpendicular to said plate means opposite said handle means for receiving a box top therebetween for separating that portion of a box top received therebetween from the sides of the box and bending said portion upwardly to open one corner of the box to provide access to the contents thereof, said first jaw being comprised of a substantially rectilinear plate having a width and length sufficient to overlie a substantial portion of the upper surface of the box top and said second jaw being comprised of a triangular plate the base of which is equal to the width of the upper plate and the length of which is greater than half the length but considerably less than the full length of said first plate, the edges of said triangular second plate remote from said first plate being beveled to facilitate insertion of said second plate beneath a box top and reinforcing means secured to and extending perpendicularly to said plate means and said jaws for reinforcing said jaws against bending movement relative to said plate means.

4,371,022

GOLF CLUB CADDY

Joseph G. Goulart, 5372 Clairemont Mesa Blvd., San Diego, Calif. 92117

Filed May 26, 1981, Ser. No. 266,716
Int. Cl.³ A63B *55/00*
U.S. Cl. 150—1.5 R **8 Claims**



1. A one piece combination golf club carrier and golf stand adaptor, comprising:

a light weight substantially cylindrical, hollow body of flexible material with sufficient rigidity to maintain its general shape and having a hand grip at the top thereof;

a portion of said body beneath said hand grip being cut away to form a club shaft passage with retaining ring straps extending from the bottom of said body at the rear portion of said body adjacent said passage;

fastening means on said straps for permitting quick fastening and unfastening of said straps;

a substantially circular open throat at the forward end of said body tilted upwardly relative to said body axis and smaller in diameter than the length of a golf club head;

a neck portion flaring downwardly from said throat and extending below said body;

said body constituting a golf club carrier when said straps are fastened to form a retaining ring for retaining several golf clubs within said throat hollow body, and retaining ring and out the open back of said hollow body; and

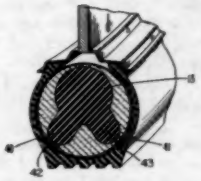
said body forming a golf club stand adaptor with at least three of said golf club shafts when said straps are unfastened and said golf club shafts are extended through said passage and into said flared neck portion with said stand supported on the ground solely by the ends of said club shafts and with said throat engaging said club shafts intermediate their ends for maintaining said clubs in the spread position.

4,371,023

TUBELESS TIRE WITH INSERT FOR PREVENTING COLLAPSE IN THE EVENT OF LOSS OF AIR PRESSURE

Thomas G. Campagna, Selden, N.Y., assignor to Aqualume, Incorporated, Selden, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,425
Int. Cl.³ B60C *17/00, 13/00, 9/00*
U.S. Cl. 152—158 **10 Claims**



1. The combination of an inflatable tubeless tire and an insert within the tubeless tire for preventing collapse in the event of loss of air pressure, the insert comprising:

(a) a toroidal core of solid material;

(b) a resilient foam casing annularly surrounding the core;

(c) a thin outer flexible shell annularly surrounding the casing; and

(d) flange means flexibly and integrally formed as part of the core for bowing out towrds the tire sidewalls after puncture of other loss of air pressure to give added strength to the tire sidewalls and prevent additional collapse.

2. The combination of an inflatable tubeless tire and an insert within the tubeless tire for preventing collapse in the event of loss of air pressure, the insert comprising:

(a) a toroidal core of solid material;

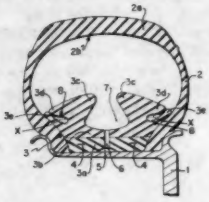
(b) a resilient foam casing annularly surrounding the core;

(c) a thin outer flexible shell annularly surrounding the casing; and further including wedge means attached to the interior of the tire sidewalls to give added strength thereto and prevent additional sidewall collapse after puncture or other loss of air pressure.

4,371,024
EMERGENCY RUNNING RING FOR PNEUMATIC VEHICLE TIRES

Hermann Stein, Wuppertal-Barmen, and Ulrich Piepenbrink, Schwelm, both of Fed. Rep. of Germany, assignors to Vorwerk & Sohn GmbH & Co. KG, Wuppertal-Barmen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,136
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1930, 3008972
Int. Cl.³ B60C *17/00, 5/00*
U.S. Cl. 152—158 11 Claims



1. An emergency running ring for a tubeless pneumatic tire adapted to be mounted on a tire rim, comprising

(a) a bottom reinforced base for mounting the ring on such rim,

(b) at least one radial opening in said ring to permit air to be admitted to the interior of the tire,

(c) cavity means formed in said ring adapted to be filled with a lubricating material,

(d) sealing lips and counter lips directly engaging each other for closing said cavity means and sealing said lubricant therein when said tire is mounted on said rim and under pressure, one of said sealing lips and counter lips being formed with a denticulated sealing surface thereby to provide a plurality of sealing faces between said lips, thereby sealing the cavity filled with lubricant,

(e) flange means integrally formed with said sealing lips and extending radially upwardly with respect to said sealing lips for engagement by the inside of the tire during loss of air,

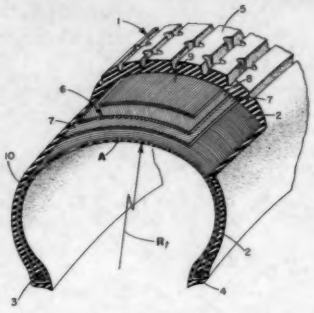
said sealing lips and flange means being formed and arranged such that when said flange means are depressed, lever action causes said sealing lips to move so as to open said cavities and permit said lubricating material to be released to reduce friction between said tire and said running ring.

4,371,025
REINFORCING ANNULAR STRUCTURE OF RADIAL TIRES

Cesare Canevari, and Aldo Signorini, both of Milan, Italy, assignors to Societa' Pneumatici Pirelli S.p.A., Milan, Italy

Filed Jun. 9, 1981, Ser. No. 271,963
Claims priority, application Italy, Jul. 8, 1980, 23297 A/80
Int. Cl.³ B60C *3/00, 9/20*
U.S. Cl. 152—352 R 4 Claims

1. A vehicle tire comprising a radial carcass having a crown point on a meridian plane, a tread, an annular reinforcing structure between the carcass and tread, said annular reinforcing structure comprising at least two reinforcing layers of metal monofilaments, each monofilament being embedded in said reinforcing layers as a single individual, metallic element spaced from the adjacent filaments, said monofilaments of each layer being parallel to one another and inclined at an angle between 10° and 30° with respect to the direction of the equatorial plane of the tire, the monofilaments of one layer crossing those of the adjacent layer, said carcass having a radius of

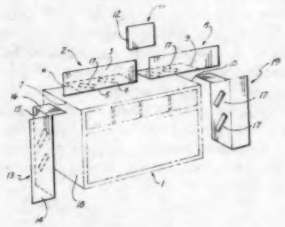


curvature on the meridian plane in its crown point of at least 400 mm.

4,371,026
AIR CONDITIONER SUPPORTED CURTAIN HOLDER

Pauline K. Miller, deceased, late of Baltimore, Md., and by Norman Miller, legatee, 520 Cedar Hill Rd., Baltimore, Md. 21225

Filed Jul. 8, 1980, Ser. No. 167,153
Int. Cl.³ A47H *1/18*
U.S. Cl. 160—349 D 8 Claims



1. A curtain holder, comprising:

a. panel means for holding curtains or drapes out of the path of air flow of a window air conditioner unit, wherein said panel means are comprised of top panel means disposed adjacent to the top of the air conditioner unit and side panel means disposed adjacent to the sides of the air conditioner unit, and wherein said top and side panel means have two planar portions, a first planar portion to which air conditioner attaching means are attached, and a second planar portion perpendicular to said first planar portion which holds the curtains or drapes out of the path of air flow of the window air conditioner unit;

b. a means for attaching said panel means to the window air conditioner unit.

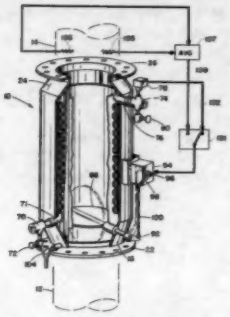
4,371,027
ECONOMIZER WITH AN INTEGRAL GAS BYPASS

Orval E. Jacobsen, 4270 E. 78th St., Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 612,043, Sep. 10, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,712
Int. Cl.³ F28F *19/00*
U.S. Cl. 165—1 2 Claims

1. A method for controlling corrosion in exhaust gas heat exchanger comprising the steps of:

(a) determining the dew point temperature of the corrosive elements of the exhaust gases;
(b) moving the exhaust gases through a fluid heat exchanger;
(c) detecting the temperature of the exhaust gases downstream of the heat exchanger;



(d) comparing the detected temperature with the dew point temperature;
(e) bypassing the exhaust gases around the heat exchanger when the detected temperature approaches or falls below the dew point temperature.

4,371,028

HEAT STORAGE DEVICE

Egon Helshoj, Holte, Denmark, assignor to Effex Innovation A/S, Copenhagen, Denmark

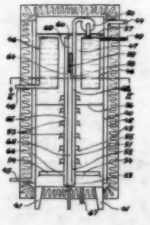
PCT No. PCT/DK80/00008, § 371 Date Sep. 17, 1980, § 102(e) Date Sep. 17, 1980, PCT Pub. No. WO80/01509, PCT Pub. Date Jul. 24, 1980

PCT Filed Jan. 18, 1980, Ser. No. 206,484

Claims priority, application Denmark, Jan. 22, 1979, 261/79

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—10 **10 Claims**



1. A heat storage device comprising a container which contains a storage material for storing and supplying heat during melting and solidification, respectively, and means including a pump for pumping a heat carrying medium through a circuit in which it is brought into direct heat exchange contact with the storage material, characterized in that said circuit comprises a plurality of channels connecting the delivery side of the pump to a plurality of outlet openings or groups of outlet openings distributed in the storage material, and that the device includes valve means located outside the storage material for controlling flow of said heat carrying medium through at least two of said channels connecting the delivery side of the pump and the outlet openings or groups of outlet openings in response to variations in flow resistances.

4,371,029

LATENT HEAT ACCUMULATOR

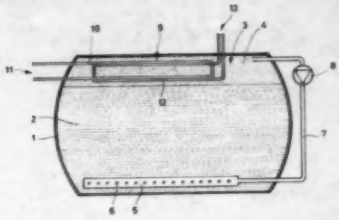
Friedrich Lindner, Stuttgart, and Kurt Scheunemann, Emmendingen, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 244,969

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010625

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—10 **9 Claims**



1. Latent heat accumulator comprising a vessel for receiving a latent heat storage medium and a circuit for a heat exchanger medium, said heat exchanger medium being immiscible with the latent heat storage medium, having a different density to the heat storage medium and being openly conveyed through the storage medium, a collecting chamber being provided in the vessel for the heat exchanger medium, a heat exchanger being disposed in said collecting chamber, an external heat carrier medium flowing through said heat exchanger, this heat exchanger bringing about a transfer of heat between heat carrier medium and heat exchange medium, characterized in that a first heat carrier medium adding heat and a second heat carrier medium withdrawing heat are conveyed in the heat exchanger (9) in separate conduit systems (11, 13), the two conduit systems (11, 13) being in heat-conductive contact with each other and with the surrounding heat exchanger medium (4).

4,371,030

Patent Not Issued For This Number

4,371,031

ARRANGEMENT FOR AIR CONDITIONING CONTROL IN BUILDINGS

Karl-Gustav Bernander, and Lars Skogström, both of Stockholm, Sweden, assignors to Aeromator Trading Co. AB and AB Strangbetong, both of Stockholm, Sweden

PCT No. PCT/SE79/00218, § 371 Date Jun. 25, 1980, § 102(e) Date Jun. 12, 1980, PCT Pub. No. WO80/00858, PCT Pub. Date May 1, 1980

PCT Filed Oct. 25, 1979, Ser. No. 198,105

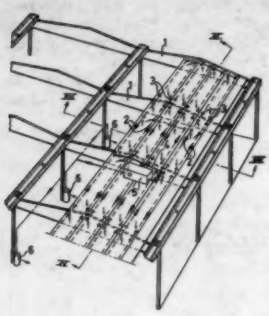
Claims priority, application Sweden, Oct. 25, 1978, 7811114

Int. Cl.³ F24H *3/02*

U.S. Cl. 165—54 **8 Claims**

1. An arrangement for air condition control of buildings of the type having a roof constructed of self-supporting roof plates having substantial mass and a relatively wide span, and a covering layer supported on the outside of the roof plates to provide an air gap between said roof plates and said covering layer for passing air therethrough, comprising ducts formed in said roof plates, an opening in one end of said ducts, an air conditioning unit, air intakes connected to the interior of the

building, means for connecting said opening to said air conditioning unit and to said intakes, and one or more upward con-



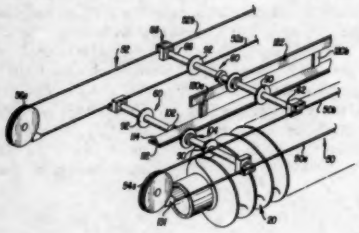
necting means connecting said ducts to said air gap located thereabove.

4,371,032

HEAT TRANSFER SYSTEM

Horace J. Buttner, 1501 Palos Verdes Dr., N. #127, Harbor City, Calif. 90710

Filed Dec. 22, 1980, Ser. No. 219,022
Int. Cl.³ F28D *11/02*; F28G *15/04*
U.S. Cl. 165—91 **25 Claims**



1. Heat transfer apparatus with endless loop guided volute passage scraping means, comprising:

a housing including an inlet for introducing workable material into said housing and further including an outlet for discharge of said workable material from said housing;

at least first and second endless loop members positioned in spaced planes extending in said housing;

loop support means connected with said housing and including at least two oppositely and outwardly curved surfaces for supporting each of said first and second endless loop members in its respective plane;

at least one bridging member extending between and attached to corresponding portions of said first and second endless loops for causing said bridging member to move in a loop path defined by motion of said endless loop members;

a mixing member mounted for rotation in said housing adjacent at least a portion of the loop path traversed by said bridging member, said mixing member including at least one flute at its outer surface defining at least one volute passageway;

means mounted in said housing for transferring heat to or from said workable material;

scraper means having an outline corresponding to at least a portion of the cross-section of said volute passageway and connected with said first and second endless loop members through said bridging member for scrapingly contacting and cleaning the walls of said volute passageway during rotation of said mixing member;

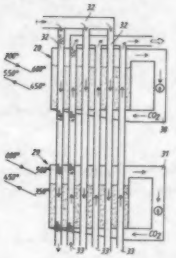
whereby said first and second endless loop members repetitively introduce said scraper means into contact with an upstream portion of said volute passageway and, after movement of said scraper means to a downstream portion of said passageway while in contact with and during rotation of said rotatable member, convey said scraper means from said downstream portion to said upstream portion.

4,371,033

GAS-TO-GAS HEAT EXCHANGER

Gunnar Stendahl, Linköping, Sweden, assignor to STAL-LAVAL Apparat AB, Linköping, Sweden

Filed Mar. 13, 1981, Ser. No. 243,556
Int. Cl.³ F28D *13/00*; F28C *3/16*
U.S. Cl. 165—104.16 **5 Claims**



1. A gas-to-gas heat exchanger, comprising at least two chambers each enclosing a bed of fluidizable particulate material, a first set of tubes and a second set of tubes passing substantially vertically through at least part of each of said chambers; said first and second sets of tubes being mutually disposed in spaced-apart relationship; means for introducing a first gaseous medium at a first temperature into said first set of tubes for downward passage therethrough, means for introducing a second gaseous medium at a second temperature, lower than said first temperature, into said second set of tubes for upward passage therethrough, and means for passing a third gaseous medium through said chambers for creating fluidized beds of said particulate material, whereby said fluidized beds serve as heat transfer media from said first tube sets to said second tube sets, thus obtaining heat transfer in a plurality of temperature stages, one for each of said chambers.

4,371,034

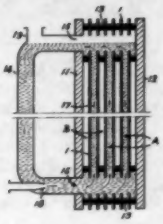
PLATE TYPE EVAPORATOR

Ken'ichi Yamada; Hiroyuki Sumitomo; Akira Horiguchi, and Kenzo Masutani, all of Osaka, Japan, assignors to Hisaka Works, Limited, Osaka, Japan

Division of Ser. No. 63,403, Aug. 3, 1979. This application Jan. 27, 1981, Ser. No. 228,755
Int. Cl.³ F28B *9/08, 9/02*
U.S. Cl. 165—108 **1 Claim**

1. A plate type evaporator comprising a plurality of vertically extending plate elements assembled face-to-face to define therebetween alternate channels for a heating medium and for a liquid to be evaporated, a liquid circulation passageway establishing communication between the top and bottom of said liquid channels, a vapor taking-out port provided in the top of said circulation passageway, and a liquid supplying nozzle provided in said circulation passageway for supplying liquid to compensate for the amount evaporated, said circulation passageway allowing the natural circulation of the liquid which is brought about by the pumping effect due to the evaporation of liquid, the injection of the supply liquid from said

nozzle accelerating said circulation, whereby flow is imparted to the liquid along the heat transfer surfaces of the plate elements, each plate element being formed with a porous layer on its heat transfer surface facing the associated liquid channel.

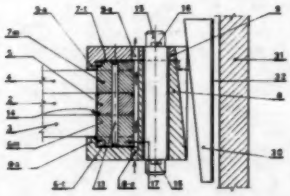


4,371,035

TUBE SUPPORT GRID

Vincenzo Soligno, Via Voltarno, 9, 27058 - Voghera, Italy

Filed May 16, 1979, Ser. No. 39,680
Claims priority, application Italy, May 17, 1978, 23511 A/78
Int. Cl.³ F28F 9/18
U.S. Cl. 165—162 8 Claims



1. For use in a steam generator, heat exchanger and the like having a plurality of tubes located within a casing, a supporting grid for tubes comprising:

a. a central reticular structure for supporting the tubes formed of a first material and consisting of a lower and an upper set of equally spaced main intersecting strips having interengaging main milled slots at the intersecting zones and equally spaced secondary milled slots therebetween, and a lower and an upper set of equally spaced secondary strips located in said secondary milled slots, said lower and upper main strips terminating with L-shaped ends inwardly facing each other respectively;

b. an inner annular frame of the same first material capable of receiving with a tight fit the ends of said strips and being higher than the reticular structure so that upper and lower projecting portions are created together with cleaning ducts;

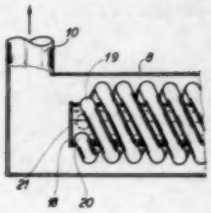
c. an external annular frame connectable to the casing and formed of a second material and consisting of an external lower box ring and of an external upper cover ring capable of receiving and containing therein said projecting portions of the inner frame, axially extending and inwardly facing dogs being provided at the inner portion of said external frame; the inner frame and the external frame being assembled so that at room temperature said dogs of the external frame fit tightly to the inner cylindrical surface of said projecting portions while play exists between the external cylindrical surface of the inner frame and the internal cylindrical surface of the external frame for free thermal expansion of the two materials.

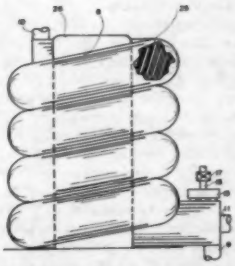
4,371,036

HEAT EXCHANGER, PARTICULARLY FOR HEAT PUMPS

Marc Fordsmand, Skovshovedvej 38, DK-2920 Charlottenlund, Denmark

Filed Jun. 4, 1980, Ser. No. 156,272
Int. Cl.³ F28D 7/02
U.S. Cl. 165—163 5 Claims





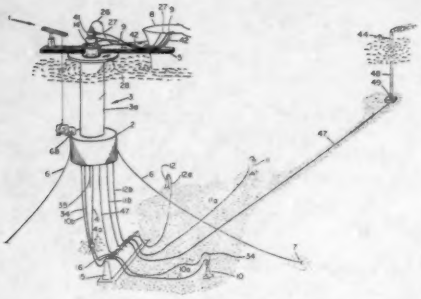
1. A heat exchanger, particularly for heat pumps, comprising at least one helical pipe forming part of a secondary part for the flow of a refrigerant, a mantle-pipe surrounding said at least one helical pipe and forming a primary part for the flow of a heat carrying medium, a core pipe also forming part of said secondary part, said at least one helical pipe being coiled around said core pipe and extending substantially from one end to the other end of said mantle-pipe, both said helical pipe and said core pipe being in heat exchange relationship with the flow of the heat carrying medium in said mantle-pipe, refrigerant inlet means and outlet means both located outside said mantle-pipe, said at least one helical pipe being connected to said core pipe near said other end of said mantle-pipe and being connected near said one end to said refrigerant inlet means, said core pipe being connected near said one end to said refrigerant outlet means, said mantle-pipe having a heat carrying medium inlet at said first end and a heat carrying medium outlet at said other end, the center line of the turns of said at least one helical pipe extending horizontally or at an inclination small enough to ensure that the centrifugal force acting on a liquid refrigerant particle travelling through a turn will alternatively be added to and subtracted from the gravity of the same particle, said mantle-pipe with said helical pipe and said core pipe therein being bent to a compacted shape.

4,371,037

TRANSFER TERMINAL FOR OFFSHORE PRODUCTION

Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 11,817, Feb. 9, 1979, Pat. No. 4,265,313. This application Dec. 15, 1980, Ser. No. 216,452
Claims priority, application France, Feb. 14, 1978, 78 04330
Int. Cl.³ E21B 43/017
U.S. Cl. 166—366 12 Claims



1. A mooring station and transfer terminal for off-shore hydrocarbon production from a plurality of underwater wells connected to a plurality of production lines, each line communicating with one of said wells, said mooring station and transfer terminal comprising:

at least one underwater production manifold communicating with said production lines;

at least one underwater circulation and safety manifold communicating with said plurality of underwater wells; at least one return circulation manifold communicating with said plurality of underwater wells; a riser comprising at least three coaxial pipes defining at least two annular space therebetween, said coaxial pipes including at least one production pipe communicating at its lower end with said production manifold, at least one circulation and safety pipe communicating at its lower end with said circulation and safety manifold, and at least one return circulation pipe communicating at its lower end with said return circulation manifold; and a surface facility comprising means for receiving the outflow of said at least one production pipe and communicating with the upper end thereof, said surface facility further comprising a source of safety fluid communicating with the upper end of said circulation and safety pipe.

4,371,038

APPARATUS AND METHOD FOR INJECTING FLUID INTO A WELL

William L. Abernathy, Lafayette, La.; Billy B. Bertram, Plano, Tex.; Anthony D. Davis, Carrollton, Tex., and Richard M. Ward, Arlington, Tex., assignors to Otis Engineering Corporation, Dallas and Exxon Production Research Company, Houston, both of, Tex.

Filed Dec. 8, 1980, Ser. No. 213,896
Int. Cl.³ E21B 33/129, 34/14, 41/02, 43/12
U.S. Cl. 166—380 27 Claims

1. For use in injecting fluids into a well which includes a casing and a string of large capacity production tubing, an assembly comprising

a packer to be set in said casing adjacent to the well producing zone, said packer having a large bore;

twin flow means to be joined to the lower end of said string of production tubing; said twin flow means providing, side-by-side, a first large capacity passage communicating with said production tubing and a second small capacity passage opening from the upper end of said twin flow means; said twin flow means including, at its lower end, an inner large capacity tubing and an enclosed outer tubular housing; said inner tubing defining a continuation of said first passage, and the annulus between said outer housing and said inner tubing defining a continuation of said second passage;

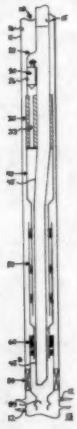
an extensible, large bore, tubular housing means joined at its upper end to said outer housing of said twin flow means;

means for joining the lower end of said extensible tubular housing means to the upper end of said packer;

a length of large capacity inner tubing joined to said inner tubing of said twin flow means; said length of inner tubing being of a length to extend into said packer adjacent to the lower end thereof, when said extensible housing means is in its retracted condition;

said large capacity inner tubing defining an extension of said first large capacity passage for passing fluid from the producing zone; and the annulus between said inner tubing and the enclosing structure defining an extension of said second small capacity passage to pass injection fluid to the lower end of said inner tubing.

13. A method for providing production and injection passages in a producing wall having a casing and a string of large capacity production tubing, wherein the injection passage extends to a point very close to the producing zone of the well; including the steps



setting, in the casing, a packer having an internal passage of sufficient size to pass large capacity production tubing with an annular flow space therebetween;

suspending, from the lower end of said production tubing, an assembly including an upper twin flow means, a lower large bore extensible tubular housing means joined to said twin flow means, for joining to said packer, and a length of large capacity inner tubing;

providing, side-by-side, in said twin flow means, a first large capacity passage communicating with said string of production tubing and a second small capacity passage communicating with the annulus between said casing and said string of production tubing, with the lower end of said first passage terminating in a large capacity inner tubing and the lower end of said second passage terminating in the annulus between said inner tubing and an outer housing;

joining the upper end of said extensible housing means to said outer housing of said twin flow means;

providing said extensible housing means with releasable means for maintaining said housing in a retracted condition;

suspending said length of large capacity inner tubing from

said inner tubing of said twin flow means to extend through said extensible housing means, and said packer to a point adjacent to the bottom thereof, when said extensible housing is in said retracted condition;

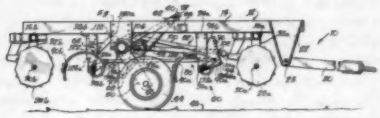
whereby said inner tubing provides an extension of said first large capacity passage for passing production fluid from the producing zone; and whereby the annulus between said inner tubing and the enclosing structure provides an extension of said second passage for passing injection fluid from the annulus between said casing and said string of production tubing to the lower end of said inner tubing.

4,371,039

TOOL BAR CONTROL FOR AGRICULTURAL IMPLEMENT

Wayne J. Schaaf, and Bennie J. Boswell, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 13, 1981, Ser. No. 253,571
Int. Cl.³ A01B *63/22, 63/32*
U.S. Cl. 172—244 **10 Claims**



1. An agricultural implement comprising, in combination, a frame,

at least two tool bars supported by said frame for rotation about their longitudinal axes and each carrying at least one ground working tool thereon for movement therewith,

wheel means mounted on said frame and movable between a lowered transport position wherein said frame and ground working tools are raised for transport and a raised position wherein said frame and ground working tools are lowered for ground working operation,

operator means operatively associated with said wheel means and adapted to move said wheel means between its said lowered and raised positions,

and a control mechanism operatively associated with said wheel means and said tool bars so as to effect predetermined rotation of said tool bars when said wheel means is moved between its said lowered and raised positions, said control mechanism including first linkage means interconnecting one of said tool bars to said wheel means so that movement of said wheel means from its said lowered to its said raised positions effects rotation of said one of said tool bars in a predetermined direction,

second linkage means intereconnecting the other of said tool bars to said wheel means so that movement of said wheel means from its said lowered to its said raised positions is inoperative to effect rotation of said other of said tool bars through said second linkage means, while movement of said wheel means from its said raised to its said lowered positions is operative to effect rotation of said other of said tool bars through said second linkage means in a direction opposite to said predetermined direction,

and third linkage means directly interconnecting said tool bars so that rotation of either of said tool bars effects a corresponding rotation of the other of said tool bars,

wherein said first linkage means includes a connector plate mounted on said one of said tool bars for movement therewith, and a pair of actuator links pivotally connected to said connector plate and interconnecting said connector plate to said wheel means, and,

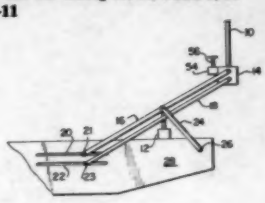
wherein each of said actuator links has lost motion connection with said connector plate, one of said actuator links being adapted to effect rotation of said connector plate and said one of said tool bars in said predetermined rotational direction in response to movement of said wheel means from its said lowered to its said raised positions, and the other of said actuator links being adapted to limit the extent of said rotation of said one of said tool bars in said predetermined rotational direction.

4,371,040

ANTI-BUCKLING DEVICE FOR MINE-ROOF BOLTING MACHINES

William C. Orthwein, P.O. Box 3332, Carbondale, Ill. 62901

Division of Ser. No. 20,117, Mar. 13, 1970, Pat. No. 4,328,872.
This application Aug. 26, 1981, Ser. No. 296,369
Int. Cl.³ B23Q *15/00;* **F21C** *5/16*
U.S. Cl. 173—11 **6 Claims**



1. Apparatus for use with an underground mine shaft roof bolting machine having a torque motor, a pinning rod of predetermined diameter held for rotation by said torque motor, controllable means for exerting upward thrust on said torque motor to force said pinning rod upwardly into the roof of a mine shaft, and means for manually controlling said upward thrust means, comprising:

light source means positioned for projecting a beam of light having a width not substantially larger than the diameter of said pinning rod along and substantially parallel to the length of said pinning rod;

means operatively connected for detecting said light beam and for enabling said controllable upward thrust means only when said light beam is detected, whereby buckling of said pinning rod will interrupt said light beam and cause said upward thrust means to be disabled.

4,371,041

MULTI-PURPOSE MOBILE DRILL RIG

Floyd W. Becker, and Richard R. Regimbal, both of Calgary, Canada, assignors to Drill Systems, Inc., Calgary, Canada

Filed Sep. 15, 1978, Ser. No. 942,550
Int. Cl.³ E21B *7/02;* **E21C** *11/02*
U.S. Cl. 173—28 **30 Claims**

1. A drill rig for drilling a hole in the ground comprising:

(a) a mast, having a longitudinal slide means at one mast face thereof for enabling longitudinal movement therealong, said mast being adapted to be set upright at one side of a drill hole to be drilled with the rig, with said mast face and said slide means thereon facing, and being at a selected spacing from and being parallel to the axis of the drill hole;

(b) a slide frame mounted upon said longitudinal slide means and lifter-pulldown means in the mast for causing movement of said slide frame along the longitudinal slide means;

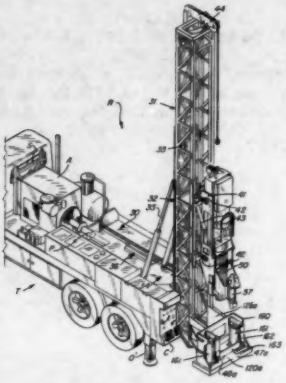
(c) a lateral shifting means on said slide frame shiftable outwardly from said mast face and the slide frame in the direction of the drill hole;

(d) a drill carrier attached to said lateral shifting means to be shifted between a first position adjacent an outward side of said slide frame and a second position spaced outwardly away from said mast and slide frame thereon;

(e) first and second separate drill mechanism means and drill pipe means being mountable upon said drill carrier for drilling the drill hole, with the drill pipe means being

aligned with the drill hole axis after the drill carrier is selectively shifted to one of the first and second aforesaid positions; and

(f) one of said separate drill mechanism means and drill pipe means being aligned with the drill hole axis when said drill carrier is at one of said first and second positions, and the



other of said separate drill mechanism means and drill pipe means being aligned with the drill hole axis when said drill carrier is at the other of said first and second positions whereby to permit quick-change selective drilling with said first and second separate drill mechanism means and drill pipe means.

4,371,042

FLUID OPERATED RAM

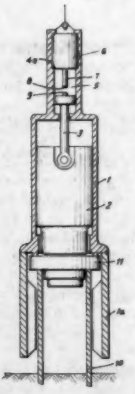
Hans Kühn, Hamburg, Fed. Rep. of Germany, assignor to Kochring GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 103,521

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900221

Int. Cl.³ B25D 9/00; E21B 1/00

U.S. Cl. 173—127 **24 Claims**



1. A fluid operated ram for driving a member into the ground, comprising an upright housing having an axis; a striker body guided in said housing for reciprocation along said axis between an active stroke and a return stroke; an impact transmitter between said striker body and the member to be driven into the ground upon striking of the striker body against said impact transmitter; a cylinder disposed at the upper end of the housing coaxially therewith; a working piston reciprocable arranged in said cylinder and dividing the latter into a first and a second chamber; a piston rod connecting said working piston with said striker body for simultaneous movement in axial direction; first passage means for connecting said first and said second chamber with a source of pressure fluid and second passage means for connecting said first chamber to a space for released fluid; control means comprising a valve slide means cooperating with said first and second passage means and being movable coaxial with said piston rod between a first position connecting at least one chamber with said first passage means and a second position connecting said first chamber with said second passage means, said valve slide means being formed with an axial bore having an open end facing said working piston; means for moving said valve slide means to said second position in dependence on the position of the striker body relative to said housing and comprising a valve rod axially guided in said bore of said valve slide means and having an end portion projecting into said first chamber, means cooperating with said valve rod for biasing the same toward said working piston, and means for limiting axial movement of said valve slide means and said valve rod relative to each other, said valve rod having a free end in said first chamber and said working piston having a contact face opposite said free end of said valve rod, the valve rod having a length adjusted so that when said striker body during its active stroke is spaced at least a predetermined distance from said impact transmitter, said free end of said valve rod abuts against said contact face and when the striker body is spaced from said impact transmitter a distance smaller than said predetermined distance, said free end of said valve rod is disengaged from said contact face; and wherein said working piston is a differential piston having a larger piston surface facing said first chamber and a smaller piston surface facing said second chamber and wherein said passage means permanently connects said second chamber with said source of pressure fluid.

4,371,043

VIBRATION PREVENTION HANDLE FOR A VIBRATION DEVICE

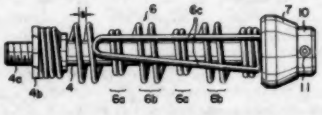
Masaharu Kubokawa, 11-8, Minaminagasaki 3-chome, Toshima-ku, Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,428

Claims priority, application Japan, Mar. 13, 1980, 55-31918

Int. Cl.³ B25G 1/00

U.S. Cl. 173—162 H **11 Claims**



1. A vibration prevention handle for a vibration device, which comprises:

(a) a handle fixed to a vibration device;

(b) a small-diameter close-coiled and larger-diameter open-coiled helical spring provided so as to cover said handle, one end of said helical spring being freely rotatably mounted to said handle, the other end of said helical spring being fixedly mounted to said handle,

whereby vibration and shock generated from the vibration device can be effectively damped.

4,371,044

SIMULTANEOUS MULTIGUN HIGH DENSITY MULTIPHASE PERFORATING UNIT

Roy L. Willig, Lafayette; Edward J. LeBlanc, III, Youngsville, and Harold Airhart, Sr., Lafayette, all of La., assignors to CRC Wireline, Inc., Grand Prairie, Tex.

Filed Aug. 22, 1980, Ser. No. 180,449
Int. Cl.³ E21B *43/116*
U.S. Cl. 175—4.6 11 Claims

1. A perforating unit for high density, multiphase well perforating operations which comprises:

(a) a plurality of elongated cylindrical perforating gun barrels having firing axes at predetermined angles one relative to the other and adapted to receive an array of charges;

(b) a multiport top sub securing together the upper ends of said barrels, with said barrels parallel to each other;

(c) a cablehead on said top sub; and

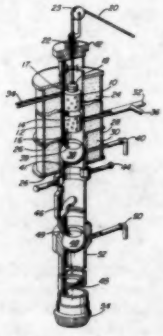
(d) a multiport bottom sub securing together the lower ends of said barrels and including means to detonate said charges.

4,371,045

METHOD AND APPARATUS FOR RECOVERING UNSTABLE CORES

Patrick L. McGuire, and Bruce L. Barraclough, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1981, Ser. No. 249,783
Int. Cl.³ E21B *25/02, 25/08, 49/02*
U.S. Cl. 175—17 12 Claims



1. A method of obtaining for laboratory study substantially intact cores of hydrocarbon hydrates, said method comprising:

(a) drilling a core out of a formation in the earth;

(b) very quickly bringing said core located within a core barrel open at its lower end up above the earth surface;

(c) allowing drilling fluid to drain out of said core barrel and away from said core; and then

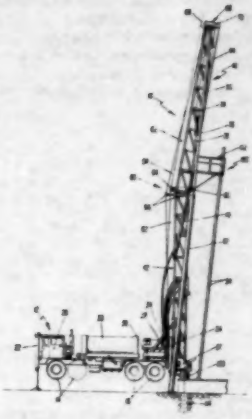
(d) passing cryogenic fluid in contact with said core located within said core barrel while said core and said core barrel are located within a chilling vessel which is formed from the upper portion of the outer pipe which houses said core and said core barrel, thus forming a stabilized core.

4,371,046

APPARATUS FOR AND METHOD OF DRILLING A HOLE INTO THE GROUND

Vernon Read, 550 N St., SW., Washington, D.C. 20024

Filed Apr. 21, 1980, Ser. No. 141,977
Int. Cl.³ E21B *7/02*
U.S. Cl. 175—57 13 Claims



1. A drilling rig adapted to be carried by a vehicle normally having a horizontal flat surface comprising a mast having upper and lower sections, each having a longitudinal axis, the lower section being mounted on the surface, the upper section being secured to the lower section so the longitudinal axes of the upper and lower sections are offset at a predetermined acute angle, a rotary power drill head translatable along the length of the lower section, the power drill head including an aperture in which drill pipe is secured, a drawworks on the vehicle, cable means extending from the drawworks over pulley means at the top of the upper section and thence downwardly, means for controlling the angle of the surface so that during drilling the surface is horizontal and the aperture is aligned with a drill hole through which drilling pipe extends and during pipe hoisting the pulley means is aligned with the hole so a portion of the cable means extends from the pulley means in line with the hole, the cable means portion being attached to the pipe during hoisting, a sheave at the intersection of the two sections, said sheave being positioned and the axes being offset so said portion of the cable means can be paid over said sheave and extend in tension to support said drill head during drilling and said portion of the cable means can be removed from said sheave during hoisting.

4,371,047

AGRICULTURAL TRACTOR HAVING REVERSE AIR FLOW COOLING

Richard A. Hale, Downers Grove, and Richard G. Hennessey, Oak Lawn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

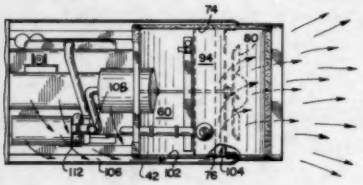
Filed Apr. 2, 1980, Ser. No. 136,870
Int. Cl.³ B60K *11/06*
U.S. Cl. 180—54 A 12 Claims

1. In an off-highway vehicle supported on a plurality of wheels said vehicle comprising an enclosed engine compartment having an open bottom and an engine compartment evacuation duct; an enclosed heat exchanger compartment having a top air entry port, an evacuation duct air delivery port for communication with said engine compartment evacuation duct and an air discharge port; a heat exchanger mounted in said heat exchanger compartment between said top air entry port and said air discharge port; an air flow inducing fan lo-

cated in said heat exchanger compartment between said heat exchanger and said air discharge port for drawing air through said heat exchanger from said top air entry port and further drawing air from said engine compartment evacuation duct wherein said enclosed engine compartment comprises:

a left side panel extending longitudinally from a rear portion of said enclosed engine compartment to said air discharge port of said enclosed heat exchanger compartment and said left side panel extending vertically from said bottom of said enclosed engine compartment and the bottom of said enclosed heat exchanger compartment to a top of said enclosed engine compartment and to a top of said enclosed heat exchanger compartment;

a right side panel extending longitudinally from the rear



portion of said enclosed engine compartment to said air discharge port of said enclosed heat exchanger compartment and said right side panel extending vertically from the bottom of said enclosed engine compartment and the bottom of said heat exchanger compartment to a top of said enclosed engine compartment and to a top of said enclosed heat exchanger compartment, said right side panel further having a raised portion projecting outwardly therefrom for forming said engine compartment evacuation duct on an inner surface of said panel and extending longitudinally from said enclosed engine compartment to said evacuation duct air delivery port;

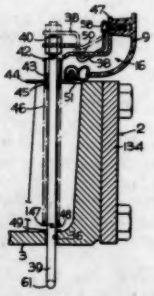
the continuous unperforated hood sheet covering said engine compartment extending from the top of said left side panel to the top of said right side panel.

4,371,048

LATCH FOR SIDE PANEL OF ENGINE HOOD

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 16, 1980, Ser. No. 197,503
Int. Cl.³ B62D *25/12*
U.S. Cl. 180—69 R **7 Claims**



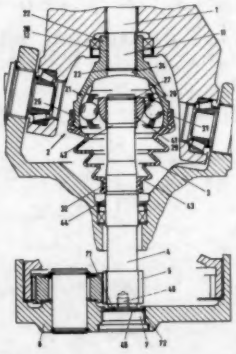
1. A vehicle having an engine hood and latching means comprising, a vehicle chassis including a front axle support means mounted on a side frame, said front axle support defining vertical walls connected to said side frame, with a floor portion extending between said walls, means defining a closed auxiliary compartment including a grille and a radiator mounted on said front axle support means, an engine hood including side panels extending over said grille and radiator and downwardly to said front axle support, a latch having a latch hook, a panel anchor mounted on the front portion of each of said panels for engaging said latch hook in the latched position, means pivotally suspending said side panels from their upper edges, a latch mounted on said vehicle chassis including a U-shaped handle having ends connected to said latch hook extending vertically through apertures in the floor portion of the axle support means inwardly of said panel, a latch hook on said latch engaging said panel anchor in the latched position, resilient means including springs on said latch handle biasing said latch hook downwardly to engage said panel anchor in the latched position, a latch cam on said latch hook formed by a downwardly extending curved portion on said latch hook, said panel anchor defining a downwardly curved leading edge for engagement with said latch cam to raise said latch hook and overcome the force of said resilient means to engage said latch when said panel is swung inwardly to close said compartment, said handle on said latch extending externally of said auxiliary compartment for manually overcoming the force of said resilient means and thereby releasing said latch.

4,371,049

STEERING AXLE

Manfred Goeft, and Dieter Maurer, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen A.G., Friedrichshafen, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,919
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922660
Int. Cl.³ F16H *3/44*
U.S. Cl. 180—255 **14 Claims**

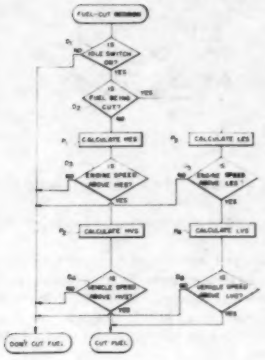


1. A steering axle comprising a steering shaft adapted to be drivingly connected with means for receiving a wheel; a shaft joint adapted to separably connect the steering shaft with a driven shaft; a joint housing for the shaft joint, said joint housing including a bell-shaped component and boot means, the bell shaped component and boot means collectively enclosing the shaft joint; steering housing means about the bell shaped component and boot means, said steering housing means having relatively movable housing components, there being an aperture between the housing components when the steering shaft is located at least at a predetermined transverse angle relative to the driven shaft, such aperture being sufficiently large to permit the shaft joint and boot means to be removed apart from the driven shaft, each of the steering shaft, the shaft joint and the boot means being removable apart from each other and from the driven shaft while the driven shaft and wheel receiving means remain substantially in position.

4,371,050
FUEL-CUT CONTROL APPARATUS

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 15, 1980, Ser. No. 121,785
Claims priority, application Japan, Feb. 16, 1979, 54-16088; Mar. 30, 1979, 54-38232
Int. Cl.³ B60K 41/02; F02D 5/00
U.S. Cl. 180—271 10 Claims



1. A fuel supply system for supplying fuel to an internal combustion engine in an automotive vehicle, comprising:

(a) a first sensor for sensing a closed position of a throttle valve;

(b) a second sensor for sensing the speed of rotation of said engine;

(c) a third sensor for sensing the speed of said vehicle;

(d) a control circuit for providing first and second signals in accordance with the sensed engine operating conditions, said control circuit being adapted to compare, in the presence of the second signal, the engine speed with a first engine speed reference level and the vehicle speed with a first vehicle speed reference level and to change said second signal to said first signal when

(i) said throttle valve is in its closed position,

(ii) said engine speed is above said first engine speed reference level, and

(iii) said vehicle speed is above said first vehicle speed reference level;

said control circuit being operable to compare, in the presence of said first signal, the engine speed with a second engine speed reference level lower than the first engine speed reference level and the vehicle speed with a second vehicle speed reference level lower than the first vehicle speed reference level and to maintain the first signal only when

(i) the throttle valve is in its closed position,

(ii) the engine speed is above the second engine speed reference level, and

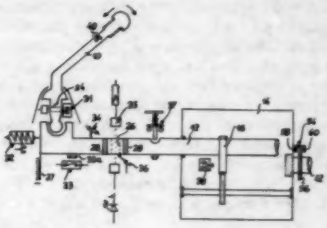
(iii) the vehicle speed is above the second vehicle speed reference level; and

(e) means responsive to the first signal from said control circuit for cutting off the supply of fuel to said engine, said means being responsive to the second signal from said control circuit for resuming the supply of fuel to said engine.

4,371,051
AUTOMATIC SWITCHING-OFF ARRANGEMENT

Rainer Achterbolt, Paul-Zoll-Str. 3, D-8961 Waltenhofen 1, Fed. Rep. of Germany

Filed Sep. 23, 1980, Ser. No. 190,043
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 7927688[U]
Int. Cl.³ B60K 41/08
U.S. Cl. 180—271 1 Claim

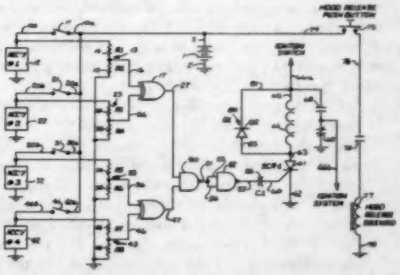


1. An improved arrangement for automatically switching-off the internal combustion engine of a motor car, the motor car being of the type having a power transmission system, gear shift means, a control lever operatively connected to the gear shift means for operating the gear shaft means, sensing means responsive to a movement of one of the control lever and the gear shaft means, the sensing means including a pair of sensing elements cooperating with one another and forming a switch, and time delay means operatively connected to said switch for delaying the switching-off of the internal combustion engine, the improvement comprising at least one of the pair of sensing elements which forms said switch being immovably fixed relative to the movement of one of the control lever and the gear shaft means, and the sensing means being responsive in the neutral position of the gear shift means and the control lever to close said switch and permit the transmission of a switch-off signal to activate said time delay means, and thereby initiate switching-off of the internal combustion engine.

4,371,052
ANTI-THEFT DEVICE FOR MOTOR VEHICLES

Warren J. Brandt, Burbank, Calif., assignor to O. C. Jenkins, Santa Ana, Calif.

Filed Mar. 31, 1980, Ser. No. 135,272
Int. Cl.³ B60R 25/00
U.S. Cl. 180—287 12 Claims



1. In a motor vehicle having a basic electrical circuit, at least two switch-operated accessories and lead wires connecting each switch to the respective accessory, an anti-theft device comprising relay-operated means rendering said vehicle ignition inoperable; a transistor-transistor-logic integrated circuit of the two-input Exclusive OR Gate type having first and

second input terminals and an output terminal, the first of said input terminals being electrically connected to the lead wire of one of said accessories and the second of said input terminals being electrically connected to the lead wire of the second of said accessories; and a normally open relay switch operably connected to said output terminal and arranged to activate said relay-operated means so as to inactivate the means rendering the vehicle ignition inoperable when one of said accessories is turned on and the other of said accessories is turned off.

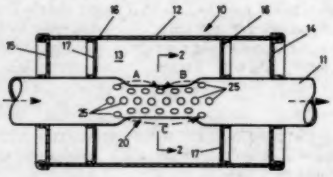
9. In a motor vehicle having a basic electrical circuit, at least two accessory switches which normally can be turned on or off without affecting the operation of the ignition when the motor is running, and lead wires connecting each switch to an accessory, an anti-theft device comprising relay-operated means normally rendering the ignition of said vehicle inoperative; a normally open relay switch arranged to inactivate when closed, the means rendering the ignition inoperative; means activating said relay switch when one of said accessory switches is turned on and means for inactivating said relay switch when a second accessory switch is turned on.

4,371,053

PERFORATE TUBE MUFFLER

Adrian D. Jones, Edwardstown, Australia, assignor to Hills Industrie Limited, Edwardstown, Australia

Filed Mar. 12, 1981, Ser. No. 242,935
Claims priority, application Australia, Mar. 17, 1980, PE2781
Int. Cl.³ F01N 1/02
U.S. Cl. 181—249 **1 Claim**



1. A muffler comprising a housing having end plates, stiffeners between the end plates, said stiffeners containing apertures which extend therethrough, a generally circular section conduit extending through said housing and being supported by said stiffeners and said end plates, said housing and conduit defining therebetween a muffler space,

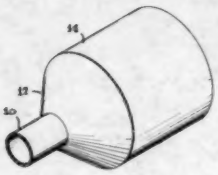
an apertured zone extending along part of said conduit between said stiffeners wherein apertures through the conduit wall provide gas flow passages between the space within the conduit and the muffler space, the apertured zone having depressions in the conduit wall which vary its shape from a circular to a non-circular shape which comprises a throat, the dimensions being such that, when gas flows through said conduit, there is a first gas flow from the upstream end of the apertured zone into the muffler space and back into the throat of the conduit, a second gas flow from the downstream end of the apertured zone into the muffler space and back into the throat of the conduit, and a third gas flow from the upstream end of the apertured zone through the muffler space and back into the conduit through some of the apertures which are in the downstream end of the apertured zone.

4,371,054

FLOW DUCT SOUND ATTENUATOR

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Continuation of Ser. No. 887,191, Mar. 16, 1978, abandoned.
This application Dec. 21, 1979, Ser. No. 106,186
Int. Cl.³ F01N 1/10
U.S. Cl. 181—252 **19 Claims**



1. A sound attenuator for ducts containing fluid flow comprising:

(a) an elongated chamber having a fluid flow inlet and a fluid flow outlet;

(b) a dissipative sound absorptive structure within said chamber having an acoustic input impedance close to the characteristic impedance of said fluid for optimally receiving sound of a given low frequency, said absorptive structure being adapted to attenuate at least said low frequency sound;

(c) duct means within said chamber for allowing the passage of said fluid flow from said inlet to said outlet and having an acoustic input impedance substantially different from the characteristic impedance of said fluid at said low frequency to cause said low frequency sound to be reflected therefrom and to allow high frequency sound to pass therethrough, said sound absorptive structure being arranged with respect to said duct means to receive and attenuate the low frequency sound reflected by said duct means;

whereby sound propagation paths having substantially different input impedances are provided for said low and high frequency sounds.

4,371,055

METHOD OF MANUFACTURING A FIBERGLASS LADDER

Larry J. Ashton, Mapleton, and Ronald R. Grimes, Provo, both of Utah, assignors to Little Giant Industries, Inc., Provo, Utah

Filed Nov. 7, 1980, Ser. No. 204,745
Int. Cl.³ E06C 1/18, 1/32, 7/08
U.S. Cl. 182—46 **5 Claims**

1. A method for making a ladder from composite materials having a first pair of side rails slidably mounted in telescopic relation within a second pair of side rails, the steps of the method comprising:

winding strands of resin-saturated fibers on a cylindrical drum such that the fibers are angularly oriented with respect to each other, thereby forming a sheet about the drum comprising at least one layer of resin-saturated fibers;

removing the sheet of resin-saturated fibers from the cylindrical drum;

cutting the sheet into long narrow strips such that the fibers are obliquely oriented with respect to a longitudinal axis of said strips;

placing the strips into molds corresponding to the side rails of said first and said second side rail pairs such that the longitudinal axis of each strip is parallel to a longitudinal axis of the respective mold; and

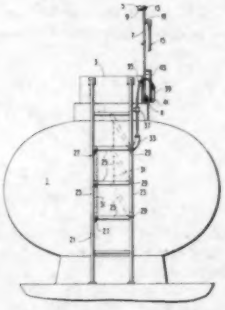
heating the resin-saturated fibers in the mold under pressure to a temperature sufficient to harden said fibers.

4,371,056

GUARDRAILING FOR VEHICLES

Rene Anglade, 48, Rue Anatole, 60110 Meru, Oise, France

Filed Feb. 10, 1981, Ser. No. 233,204
Int. Cl.³ E06C 5/06, 1/38
U.S. Cl. 182—127 **5 Claims**



1. In a motor vehicle having a guardrailing extending lengthwise of the top of the vehicle, means to raise and lower the guardrailing, and a ladder to provide access to the top of the vehicle; the improvement in which the ladder has rungs that are mounted for movement between an operative position in which the ladder gives access to the top of the vehicle and in inoperative position in which the ladder provides no access to the top of the vehicle, and means interconnecting the guardrailing and the ladder rungs whereby when the guardrailing is lowered the rungs are moved to said inoperative position and when the guardrailing is raised the rungs are moved to said operative position.

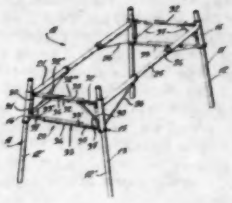
4,371,057

TELESCOPIC SCAFFOLD

Daniel Blier, Riviere-du-Loup, Canada, assignor to 100426 Canada Ltee., Quebec, Canada

Filed Dec. 16, 1980, Ser. No. 217,186
Int. Cl.³ E04G 1/14, 1/18
U.S. Cl. 182—184 **9 Claims**

1. A telescopic scaffold comprising opposed pairs of elongated support legs, each said legs being received in an adjustable sleeve member securable at a predetermined location therealong, arresting means to interlock said sleeve member with its associated leg at said predetermined location, an adjustable bracing end support structure adjustably securable between each said adjustable sleeve members of each pair of said legs to secure each leg of said pairs of legs vertically or at a desired inclined angle to each other and at a desired spacing therebetween, a tubular support member secured to each said adjustable sleeve members and extending transverse to the longitudinal axis of said adjustable sleeve member and said end bracing, an intermediate horizontal support member telescopically securable between opposed tubular members of said opposed support legs to constitute adjustable elongated side supports, a vertical flange secured along each sleeve of said pairs of sleeves, a plurality of spaced apart holes in each flange, said adjustable bracing end support structure comprising a top and bottom transverse adjustable support member secured in a spaced apart relationship across opposed legs of each pair of legs and secured at their respective ends to said flanges of said



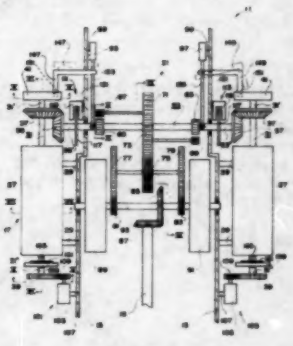
pair of sleeves, adjustably securable brace members secured adjacent an end thereof to a selected one of said holes in an associated one of said vertical flanges of one of said pairs of sleeves and extending angularly toward said top transverse support members and having its other end secured thereto to provide a rigid top transverse support, said adjustable transverse supports having their lengths adjustably secured whereby to vary said inclined angle of each said sleeves and said legs.

4,371,058

SPRING MOTOR

Joe W. Holley, 2938 S. Radford, Memphis, Tenn. 38114

Continuation-in-part of Ser. No. 68,154, Aug. 20, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,663
Int. Cl.³ F03G 1/00
U.S. Cl. 185—11 **8 Claims**



1. A spring motor for selectively rotating a drive shaft, said spring motor comprising:

(a) a casing means;

(b) first and second spring cylinder means, each of said first and second spring cylinder means including:

(i) body means for being fixedly attached to said casing means,

(ii) axle means for being rotatably attached to said body means, said axle means having a first end and a second end,

(iii) spiral power spring means having a first end for being attached to said axle means and having a second end for being attached to said body means, uncoiling of said

power spring means causing said axle means to rotate in a first direction, rotation of said axle means in a second direction causing said power spring means to coil,

(iv) a first gear member attached to said first end of said axle means, and

(v) a second gear member attached to said second end of said axle means;

(c) a transfer means for transfering rotation of said axle means of said first and second spring cylinder means to the drive shaft, said transfer means comprising:

(i) a main shaft member for being rotatably attached to said casing means and having first and second ends,

(ii) a first gear member attached to said first end of said main shaft member and for operatively engaging said first gear member of said first spring cylinder means to cause said main shaft member to rotate when said power spring means of said first spring cylinder means uncoils,

(iii) a second gear member attached to said second end of said main shaft member and for operatively engaging said first gear member of said second spring cylinder means to cause said main shaft member to rotate when said power spring means of said second spring cylinder means uncoils,

(iv) gear train means for causing the drive shaft to rotate when said main shaft member rotates,

and

(v) flywheel means for being rotated by said gear train means and for moderating any fluctuations in the speed of rotation of said main shaft member;

(d) a motor means for selectively rewinding said power spring means of said first and second spring cylinder means; and

(e) control means for causing said power spring means of said first and second spring cylinder means to uncoil in a sequential fashion one after the other, said control means including a first solenoid means for selectively preventing rotation of said axle means of said first spring cylinder means in said first direction; said control means including a second solenoid means for selectively preventing rotation of said axle means of said second spring cylinder means in said first direction; and said control means including control switch means electrically coupled to said first and second solenoid means for controlling said first and second solenoid means.

4,371,059

AUTOMATIC ADJUSTING DEVICE IN A DISC BRAKE

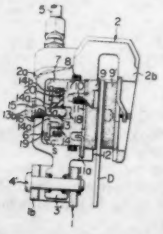
Masayuki Seki, Nagano, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 8,860, Feb. 2, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,462

Claims priority, application Japan, Feb. 6, 1978, 53-13566[U]; Feb. 7, 1978, 53-12612

Int. Cl.³ F16D *55/18*

U.S. Cl. 188—71.8 **1 Claim**



1. An improved automatic adjusting device in a disc brake of the type having a pair of friction pads, a brake caliper with a hydraulic cylinder, and a piston slidably mounted in said cylinder for urging said friction pads on the opposite sides of said brake disc for adjusting clearances between said brake pads and the brake disc at a constant level, wherein the improvement comprises:

adjusting means comprising a screw plug with a head portion detachably threaded in an air vent opening in an end wall of said cylinder, a fixed pin formed integrally with an inner end of said screw plug extending into hollow interior of said cylinder, a regulating plate disposed in a recess formed in said piston and having at its inner periphery a plurality of resilient chuck pawls mounted on said fixed pin for sliding frictional engagement and at its outer periphery a flange portion, an abutment plate fixedly secured to said piston and arranged in opposing relation with said flange portion of said regulating plate for limiting the axial displacement between said piston and said regulating plate to a given amount, and a return spring disposed between said abutment plate and said regulating plate for urging these plates in a direction apart from each other, the spring force of said return spring being larger than the force of friction engagement between said hydraulic cylinder and said piston but smaller than the force of frictional engagement between said fixed pin and said regulating plate whereby upon loosening of said screw plug, air in said cylinder can be vented through said vent opening and then said screw plug can be tightened to seal said cylinder.

4,371,060

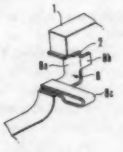
PAD CLIP FOR DISC BRAKE

Yoichi Iwata, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,551

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.38 **5 Claims**

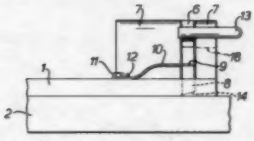


1. A pad clip for use with a disc brake and arranged to be interposed between a U-shaped guide groove in a support and a protruding part of a friction pad, said pad clip comprising a U-shaped clip body having a pair of oppositely spaced legs and a bottom part interconnecting said legs, said clip body arranged to be secured in the correspondingly U-shaped guide groove in the support, a spring part secured to the end of one of said legs of said clip body spaced from said bottom part and extending transversely of and outwardly from said leg, said spring part secured to the one of said legs arranged to be located radially inwardly with respect to the other of said legs relative to the axis of the disc brake, said spring part is a strip-like section with a first part extending outwardly from the one of said legs generally in the direction of the axis of the disc brake and away from the disc brake, and a second part reversely bent relative to said first part extending generally in the direction of the axis of the disc brake and toward the disc brake with said second part disposed in spaced juxtaposed relation to said first part.

4,371,061
BRAKE SHOES FOR RAILWAY DISC BRAKES

Gerald A. Ottewell, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 3, 1980, Ser. No. 212,369
Claims priority, application United Kingdom, Jan. 30, 1980, 8003102
Int. Cl.³ F16D 65/04
U.S. Cl. 188—244 7 Claims

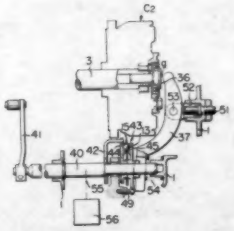


1. A brake shoe for a railway brake, the shoe comprising opposed front and rear faces, an elongate slot in said front face for mounting a brake pad on said shoe, the slot being open at one end and being slidably engagable through said open end thereof by a projection on said pad, an aperture in the shoe adjacent said open end of the slot, the aperture opening into said slot at the front face of the shoe, a retainer mounted slidingly in the aperture for engaging said brake pad to retain said pad on the shoe, the retainer being mounted on the shoe for movement between operative and retracted positions, and the retainer including a part which protrudes into said slot through the aperture in the said operative position of the retainer and which part is withdrawn through the aperture to be clear of the slot in the said retracted position of the retainer, and spring means acting at all times on said retainer in all positions thereof to bias the retainer in the direction from said retracted position towards said operative position, said spring means having one end fixed to the rear face of the shoe and an opposite end which is free and separate from said retainer and bears against a rearwardly facing surface on the retainer.

4,371,062
CLUTCH OPERATING DEVICE

Kiyokazu Ohkubo, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1980, Ser. No. 177,802
Claims priority, application Japan, Aug. 18, 1979, 54-113633[U]
Int. Cl.³ B60K 41/22; F16D 19/00
U.S. Cl. 192—3.61 10 Claims

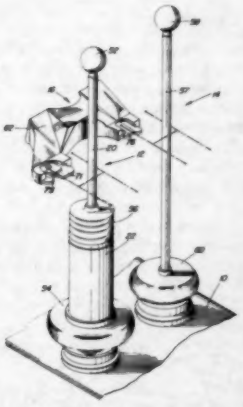


10. In a power transmission system in a two wheeled vehicle comprising: a crank casing; an engine crank shaft rotatably supported on said crank casing; a speed change input shaft rotatably supported on said crank casing in parallel relation to said crank shaft and being connected to a driven member through a speed change device; power transmission means for effecting power transmission between said crank shaft and said speed change input shaft; a clutch for controlling said power transmission means; clutch operating means for activating said clutch, said clutch operating means comprising an operating shaft, cam means disposed on said operating shaft, said cam means being movable axially as said operating shaft rotates reciprocatingly; a clutch release member for controlling setting and unsetting of said clutch; a clutch lever operatively connected between said cam means and said clutch release member for activating said clutch release member in response to axial forward movement of said cam means; and a return spring for biasing said cam means backward through said clutch lever, and means for interlocking said operating shaft and said speed change device whereby said clutch is placed in a cut-off state by reciprocating rotation of said operating shaft to cut off power transmission from said crank shaft to said speed change input shaft while activating simultaneously said speed change device.

4,371,063
PARK-LOCK MECHANISM

James O. Troemner; Peter D. Wetrich, both of Cedar Falls, and William A. Volz, Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 27, 1980, Ser. No. 200,862
Int. Cl.³ G05G 5/10
U.S. Cl. 192—4 A 13 Claims



1. A park-lock mechanism for a transmission operatively controlled by a range selector shift lever and a gear speed shift lever, said range selector shift lever being movable between a plurality of range positions, including a park position and said gear speed shift lever being movable between a plurality of speed positions, including a low speed position, said park-lock mechanism comprising:

(a) means positioned on said range selector shift lever for dividing said range selector shift lever into an upper portion and a lower portion, said means enabling said upper portion to be angularly tilted irrespective of moving said lower portion; and

(b) interlocking means mounted adjacent to said two shift levers for locking said range selector shift lever in said park position after said gear speed shift lever has been placed in said low speed position thereby providing visual assurance that said transmission is in park.

4,371,064

DRIVE AND BRAKE DEVICE FOR A BICYCLE

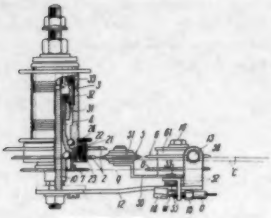
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 11, 1980, Ser. No. 176,807

Claims priority, application Japan, Aug. 28, 1979, 54-110141; Oct. 17, 1979, 54-134352; Mar. 31, 1980, 55-42701; May 15, 1980, 55-64714; May 15, 1980, 55-64715

Int. Cl.³ F16D 67/02

U.S. Cl. 192—6 A 11 Claims



1. A drive and brake device for a bicycle which drives a bicycle rear wheel hub upon normal rotation of the bicycle pedals through a front gear and driving chain, and brakes the rear wheel hub upon a reverse rotation of the bicycle pedals, said device comprising:

a rear wheel hub having a hub shaft, a hub shell supported rotatably to said hub shaft, a coaster brake mechanism housed within said hub shell and including a cylindrical brake actuator and brake shoes, said brake shoes being movable upon rotation of said brake actuator so as to brake rotation of said hub shell; a plurality of driving gears engageable with said chain; at least one transmitting means for transmitting driving force from said driving gears to said hub shell only during normal rotation of said bicycle pedals, and a braking driven member supported to said brake actuator and reversely rotatable upon reverse rotation of said pedals to cause rotation of said brake actuator;

a fixing member;

a derailleur mechanism for guiding said chain axially of said driving gears and switching said chain to one of said driving gears, said derailleur mechanism being supported to said fixing member and having a chain-switching pulley movable axially of said driving gears and a moving means for moving said pulley axially of said driving gears;

a guide pulley supported rotatably to said fixing member for guiding said chain, said chain being stretched from said front gear to said chain-switching pulley and across said guide pulley;

a braking driving member disposed coaxially with said guide pulley and operating upon a reverse rotation of said guide pulley which occurs when said pedals are reversely rotated;

and,

a transmitting mechanism for transmitting operation of said braking driving member to said braking driven member causing rotation of said brake actuator and resultant actuation of said coaster brake mechanism.

4,371,065

BRAKE-TYPE SPRING COUPLING FOR ADJUSTMENT GEARS, PARTICULARLY IN SEAT ADJUSTERS

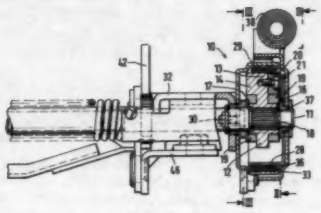
Bernd Engels; Friedrich Heise, and Heinz P. Cremer, all of Remscheid, Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 229,008

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003204

Int. Cl.³ F16D 67/02

U.S. Cl. 192—8 C 9 Claims



1. A brake-type spring coupling for adjustment gears, particularly for use in motor-vehicle seat adjusters, comprising an adjustment shaft supported for rotation about an axis; a stationary brake drum coaxially surrounding a portion of said shaft; a helical torsion spring coaxially arranged around said axis and being biased into a frictional contact with the cylindrical inner wall of said brake drum, said spring having inwardly bent end portions; a control means including a coupling segment arranged between said shaft and said spring and being supported for free rotation about said shaft; a transfer cam member rigidly secured to said shaft portion and defining at one lateral side thereof a radially directed abutment surface; a pair of follower segments supported for free rotation about said shaft and each being acted upon by an end surface of said coupling segment to be angularly displaced toward said transfer cam; said inwardly bent end portions of said spring being anchored in said follower segments to disengage said spring from said brake drum when said follower segments are rotated in a spring-tensioning direction; and means adjustably secured to the other lateral side of said transfer cam for adjusting the mutual angular position between said follower segments and the abutment surface on said transfer cam.

4,371,066

WET MULTIPLE DISC CLUTCH DEVICE FOR A VEHICLE TRANSMISSION

Kazuyoshi Fujioka, Tokyo, and Mitsuo Ikkatai, Ome, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 30, 1979, Ser. No. 98,885

Claims priority, application Japan, Dec. 29, 1978, 53-178873

Int. Cl.³ F16D 25/06

U.S. Cl. 192—85 AA 2 Claims

1. A wet multiple disc clutch device for a vehicle transmission, having an input shaft and an output shaft, comprising:

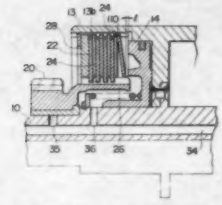
a clutch drum having a plurality of drive grooves formed on the inner surface thereof;

a plurality of plane drive plates each having a plurality of projections which engage with said drive grooves;

a plurality of plane driven plates connected to the output shaft of the vehicle transmission and interleaved with the plane drive plates to that the plane drive plates and the plane drive plates are alternately disposed to form a clutch;

a piston actuated by hydraulic control pressure and adapted to press the plane drive and plane driven plates into contact with each other; and

a conical plate disposed between an endmost one of said plane drive plates and said piston, said conical plate having at least one projection formed on the outer circumference thereof, said projection being engaged with said drive grooves on said clutch drum, said piston being



spaced axially from the inner portion of said conical plate when said clutch is disengaged and being arranged to contact said inner portion upon engagement of said clutch, thereby causing the outer portion of said conical plate to contact said endmost drive plate.

4,371,067

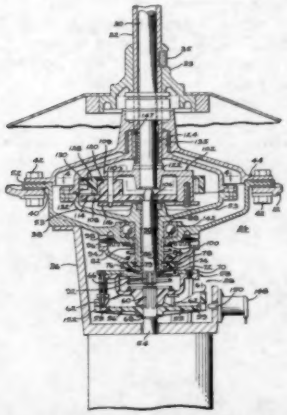
DRIVE ARRANGEMENT FOR A WASHING MACHINE

Otto F. Gerry, Gainesville, Fla., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 183,607, Sep. 2, 1980, Pat. No. 4,317,343, which is a continuation-in-part of Ser. No. 87,900, Oct. 24, 1979, abandoned. This application Nov. 9, 1981, Ser. No. 319,500

Int. Cl.³ F16D *23/12*

U.S. Cl. 192—93 A **2 Claims**



1. A power shifter for positioning a shifter element in respective axial positions on an output shaft, said shifter element mounted on said output shaft for axial sliding movement while being rotatably driven thereby, comprising:

an idler cam element rotatably mounted on said output shaft disposed opposite said shifter element; selectively operable shifter brake means movable into engagement with said idler cam element mounted to rotatably restrain said idler cam element relative to said shifter element when operated; said shifter element formed with cam followers arranged in cooperating relationship with corresponding cam contours formed on said idler cam element, said cam contours comprising axially varying circumferential contours in mating engagement with said followers and wherein one of said contours comprises an axially extending lobe and a series of axial depressions, each corresponding to axially shifted positions of said idler can element with intermediate circumferentially extending ramping surfaces to thereby produce axial movement of said shifter element by angular displacement of said output shaft when said brake means restrains rotational movement of said idler cam element;

retainer means retaining said idler cam element from moving axially away from said shifter element.

4,371,068

CLUTCH RELEASE BEARINGS

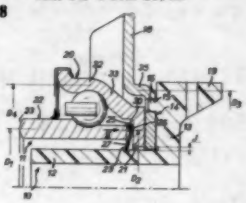
Rene Billet, Lamorlaye, France, assignor to VALEO Societe Anonyme, Paris, France

Filed Sep. 8, 1980, Ser. No. 184,629

Claims priority, application France, Sep. 10, 1979, 79 22532

Int. Cl.³ F16D *23/00*

U.S. Cl. 192—98 **13 Claims**



1. A clutch release bearing comprising an operating element having a transverse abutment member fixed axially thereto, said operating element having means cooperable with a clutch control member, a drive element comprising an anti-friction bearing including an inner race and an outer race, said inner race having a portion cooperable with clutch release means along a first circumference of said drive element, said outer race having a radially inwardly extending flange, axially acting resilient means bearing against said radially inwardly extending flange along a general line of contact forming a second circumference of said drive element and urging said drive element toward said transverse abutment member, said first and second circumferences being substantially in axial alignment with said second circumference lying within an extension of the thickness of said inner race.

4,371,069

SAFETY INTERLOCK

Peter J. Lovegrove, Lowestoft, England, assignor to Weatherford U.K. Limited, England

Filed Oct. 2, 1980, Ser. No. 193,123

Claims priority, application United Kingdom, Oct. 2, 1979, 7934201

Int. Cl.³ F16P *3/08*; B25B *17/00*

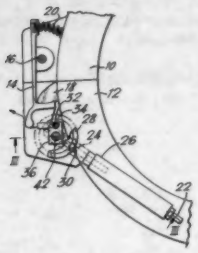
U.S. Cl. 192—135 **9 Claims**

1. A safety interlock between a machine guard and a machine actuator comprising:

(a) locking means for the guard being arranged, upon closing of the guard, to engage and thereby release an actuator locking means, and to be held in a guard locking condition by such engagement while the machine is actuated; and,

(b) actuator locking means including a holding member for the guard locking means, said holding member being mounted for movement buy the guard locking means between holding and releasing positions for such locking means, said holding member further being formed with a recess for receiving the guard locking means, the opening of said recess facing the direction of guard closing move-

ment of said locking means when in its releasing position, but facing transversely of said direction when in its hold-



ing position so that a side wall of the recess blocks guard opening movement of the locking means.

4,371,070

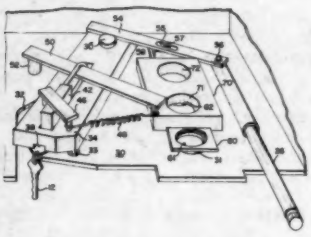
KEY DEPOSIT RETURN MACHINE

Harry L. Maxwell, Rte. 5, Box 269-A, Cookeville, Tenn. 38501

Filed Jan. 26, 1981, Ser. No. 228,545

Int. Cl.³ G07F 7/02

U.S. Cl. 194—4 D **9 Claims**



1. A key and tag assembly deposit return machine, comprising:

(a) a housing having a key and tag receiving opening, and a coin return opening,

(b) key and tag receiving means disposed within the housing and associated with the key receiving opening for receiving the key and tag within the opening and moving it into the housing,

(c) a coin return means disposed within the housing in communication with the coin return opening and associated with the key and tag receiving means for dispensing coins when a key and tag has been received by the key and tag receiving means.

4,371,071

TOKEN SENSING PHOTODETECTOR ACTUATED ELECTRONIC CONTROL AND TIMING DEVICE AND METHOD OF USE

Allan J. Abedor, and John L. Abedor, both of 865 Virginia Ave., East Lansing, Mich. 48823

Filed Apr. 24, 1981, Ser. No. 257,009

Int. Cl.³ G07F 7/00

U.S. Cl. 194—4 R **22 Claims**

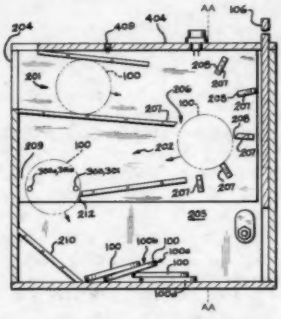
1. In an apparatus for controlling an electrical main line including an electrical circuit for controlling on-off switch means in the main line which is photoelectrically actuated by a colored translucent object with at least two sides through which light can pass the improvement which comprises:

(a) at least two spaced apart monochromatic light sources mounted in a housing so as to provide light from the sources through the object when positioned in the housing;

(b) at least two photoelectric detectors mounted in the housing so as to each receive light from only one of the light sources through the object such that a light source and a detector are coupled as a pair;

(c) positioning means within the housing for locating the object simultaneously between at least two of the light source and detector pairs;

(d) a voltage comparator circuit including at least four separate comparator subcircuits; at least two comparators responsive to a first photo detector/light source pair and at least two comparators responsive to a second photo



detector/light source pair, all comparator subcircuits connected to a gate means such that when the object is simultaneously positioned between at least two photo detector/light source pairs, the light attenuated and transmitted through the object will produce a voltage within a very narrow reference voltage range simultaneously within all comparator subcircuits, thereby simultaneously producing a desired output state from each comparator and thereby actuating the gate means connected to the on-off switch means to thereby control the on-off switch means; and

(e) electrical connection means to the main line, light source and detector pairs AND comparator circuit for providing electrical power.

4,371,072

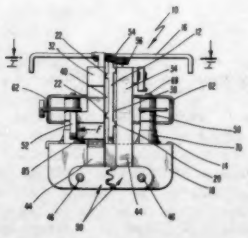
COIN-OPERATED LATCH MECHANISM

Ronald Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed Dec. 22, 1980, Ser. No. 218,775

Int. Cl.³ G07F 5/06

U.S. Cl. 194—54 **18 Claims**



1. A coin receiving mechanism for use in a coin operated latch unit, comprising:

a unitary frame member having a central wall and two inte-

gral mounting plates perpendicular to said wall respectively disposed on two opposite ends of said central wall;

first and second channel members respectively disposed on opposite sides of said central wall and spaced therefrom to define first and second coin chutes, each of said channel members having a slot therein for providing access to said coin chutes;

a pawl support mechanism mounted on one of said mounting plates; and

at least one pawl mounted on said support mechanism on each side of said central wall, said pawls being mounted for pivotal movement about axes parallel to said central wall and each having a finger which normally projects into the slot in one of said channel members.

4,371,073

COIN CHECKER FOR COINS OF VARYING DIAMETER

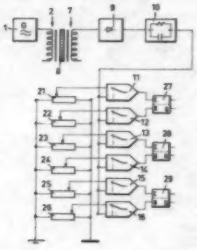
Pierre Dubey, Zollikofen, Switzerland, assignor to Autelca AG, Switzerland

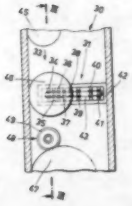
Filed Aug. 5, 1980, Ser. No. 175,579

Claims priority, application Switzerland, Aug. 8, 1979, 7300/79

Int. Cl.³ G07D 5/02

U.S. Cl. 194—102 **13 Claims**





1. A coin checker for coins of varying diameters having a coin slot channel common to all coins, said channel having two narrow and two broad sides, a coil having a core, the coil field extending through said coin slot channel to be influenced by the coins (**8**; **45–47**) passing through the channel on dependence on the diameter of the coins, and a circuit connected to evaluate the influence of the coins on the coil field and providing an output signal indicating that a coin of a predetermined diameter has travelled through said coil field, if the coin causes a variation in the coil field that lies within one of a plurality of predetermined ranges being representative for acceptable coins of different diameter, the improvement characterized in that said core consists of a plurality of shaped core parts (**34–41**, **54**, **55**) put in a row, each of said shaped core parts having at least two legs, said row of shaped core parts extending transversely to the coin travel direction from one narrow side to the other narrow side of said coin slot channel, the spacing of the mutually facing-away surfaces of the two outermost shaped core parts (**34**, **41**; **54**, **55**) corresponding approximately to the diameter of the largest acceptable type of coin in said coin slot channel and the dimension of said shaped core parts in the coin travel direction (**5**; **33**) being a fraction of the spacing of the mutually facing-away surfaces of the two outermost shaped core parts (**34,41**; **54,55**).

4,371,074

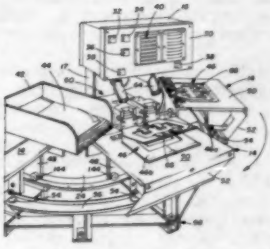
TRANSPORT SYSTEM FOR AUTOMATIC POCKET IMPLANTATION APPARATUS

Joseph W. A. Off, Irving; Judson H. Early, Dallas; Daniel K. Roady, Dallas, and Theodore B. Thayer, Dallas, all of Tex., assignors to Haggar Company, Dallas, Tex.

Filed Jul. 21, 1980, Ser. No. 170,750

Int. Cl.³ B65G 47/74

U.S. Cl. 198—339 **6 Claims**



1. In a transfer machine of the type comprising a plurality of work stations situated around a predetermined course, an endless belt mounted for movement around the predetermined course and means for incrementally advancing the endless belt, the improvement comprising:

a plurality of carriers each secured to the endless belt for movement thereby around the predetermined course;

each of the carriers comprising:

a top plate;

a first template;

means supporting the first template on the top plate for pivotal movement about an axis extending parallel to the top plate between a closed position wherein the first template engages the top plate to clamp a first object therebetween and an open position wherein the first template extends at a substantial angle with respect to the top plate;

a second template overlying the first template;

means supporting the second template on the top plate between a closed position wherein the second template engages the first template to clamp a second object therebetween and an open position wherein the second template extends at a substantial angle with respect to the top plate; and

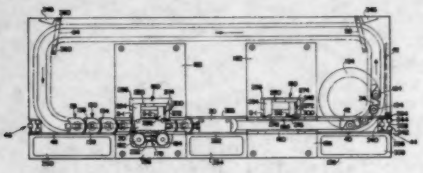
means mounted at one of the work stations on the predetermined course for first pivoting both of the templates to the open positions, for subsequently pivoting the first template only to the closed position to clamp the first object between the first template and the top plate, and for finally pivoting the second template to the closed position to clamp the second object between the second template and the first template.

4,371,075

MODULAR PRODUCTION LINE UNIT AND SYSTEM

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 4, 1980, Ser. No. 175,249
Int. Cl.³ B65G 21/20
U.S. Cl. 198—345 10 Claims



1. A work station forming part of a standardized modular unit for facilitating manual and/or mechanized work operations on a product supported on a carrier of the type including a base portion having an elongated gear rack thereon, the unit being of the type including a table having a horizontal work surface of given dimensions and an endless conveyor mounted on the table for substantially continuous movement along a horizontally extending closed loop path adjacent the work surface for sequentially transporting a plurality of the carriers to and away from said work station, said work station comprising:

means for defining a work station section on the table adjacent a selected portion of the conveyor path;

means at said work station section for defining a raised work position above the conveyor where a carrier received from the conveyor is supported for the performance of any one or more of a variety of manual and/or mechanized work operations;

means independent of the conveyor for engaging a carrier advanced into said work station section by the conveyor and for driving the engaged carrier linearly in the same direction and at substantially the same speed as the conveyor, said carrier engaging and driving means including at least one rotatably drivable gear for engaging the rack on the carrier and imparting such linear motion to the carrier in response to rotation of said gear; and

means responsive to a first advancement of the engaged carrier by said carrier engaging and driving means for lifting the engaged carrier off of the conveyor and locating it at said raised work position for performance of work operations and thereafter responsive to a second advancement by said carrier engaging and driving means for lowering the engaged carrier back onto the conveyor for transport away from said work station section.

4,371,076

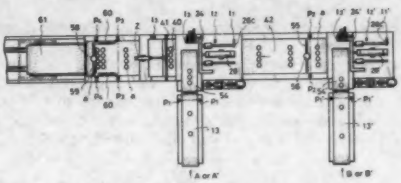
APPARATUS FOR CONVEYING AND CLOSELY GATHERING FOOD

Yasutaka Nakao, No. 207 Mutsuzane Goko, Matsudo-shi, Chiba-ken, Japan

Continuation-in-part of Ser. No. 91,039, Nov. 5, 1979, which is a continuation of Ser. No. 925,166, Jul. 17, 1978, abandoned, which is a continuation of Ser. No. 849,622, Nov. 8, 1977, abandoned, which is a continuation of Ser. No. 774,965, Mar. 7, 1977, abandoned, which is a continuation of Ser. No. 701,979, Jul. 1, 1976, abandoned, which is a continuation of Ser. No. 548,922, Feb. 11, 1975, abandoned. This application Oct. 16, 1980, Ser. No. 197,693
Claims priority, application Japan, Mar. 6, 1974, 49-25686[U]
Int. Cl.³ B65B 42/26, 57/03
U.S. Cl. 198—420 6 Claims

1. Apparatus for conveying and gathering articles comprising

a first grouping device including a feeding conveyor, a detector, a grouping conveyor, and a pusher; a second grouping device including a feeding conveyor, a detector, a grouping conveyor, a pusher and a shuttle plate arranged substantially parallel to each other; a cross conveyor; a limit switch and a transmitter for providing instructions to transfer or convey from said shuttle plate or



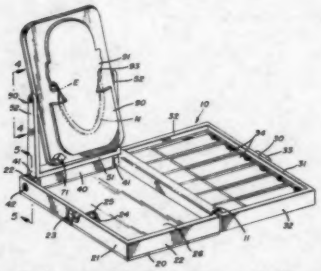
other waiting devices to said cross conveyor by means of cams driven by a driving device of said cross conveyor, said second grouping device being disposed in the neighborhood of an outlet end of said cross conveyor arranged to cross said grouping conveyors.

4,371,077

JEWELRY DISPLAY DEVICE

Samuel G. Solitt, 2121 Brookshire Rd., and Jerry Shaw, 50 W. Fairlawn Rd., both of Akron, Ohio 44313

Filed Apr. 24, 1981, Ser. No. 256,986
Int. Cl.³ B65D 81/36; A47F 7/03; A47G 1/16; B65D 73/00
U.S. Cl. 206—45.14 17 Claims



8. A jewelry display assembly for jewelry or the like, comprising:

(A) a base;

(B) a cover hinged to said base;

(C) a display unit

(a) attached to said base and

(b) being movable into and out of said base about an axis normal to the hinge axis between said cover and said base; and

(D) said display unit including an outline shape simulating at least the head of a human being for displaying the jewelry.

4,371,078

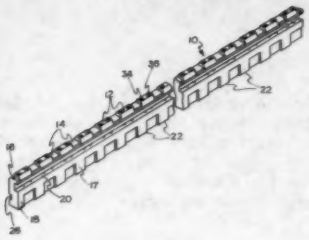
PALLET, PROCESS AND APPARATUS FOR PRODUCING CRYSTAL RESONATORS

Roger W. Hunt, Greensboro, N.C.; Brian T. Miller, Leland, and Donald R. Schroeder, Sandwich, both of Ill., assignors to CTS Corporation, Elkhart, Ind.

Filed Aug. 14, 1980, Ser. No. 177,983
Int. Cl.³ B65D 73/02
U.S. Cl. 206—329 7 Claims

1. A pallet for receiving the components of electrical devices in the assembly of such devices, comprising an electrically nonconductive, heat stabilized pallet having a plurality of spaced-apart bosses each having openings adapted to receive

the terminals of a base member, a longitudinal laterally formed groove through which said terminals are received and proportioned to receive test means contactable with said terminals for the testing of said components, a plurality of regularly spaced cog means for moving the pallet in a longitudinal direction for



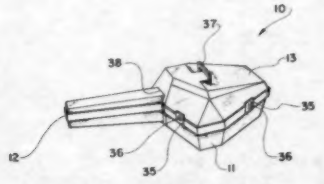
successive assembly and testing of said components mounted on the bosses of said pallet, and a longitudinal guide means extending along one face of said pallet and linearly formed therein to provide guidance and location of said components during the assembly and testing thereof.

4,371,079

CONTAINER FOR CHAIN SAWS

Andrew E. Dembicks, Raleigh, N.C., assignor to Southern Case, Inc., Raleigh, N.C.

Filed Jun. 25, 1981, Ser. No. 277,237
Int. Cl.³ B25H *3/02*; B65D *6/00*
U.S. Cl. 206—349 **9 Claims**



1. A container comprising a base portion including at least one wall, a generally U-shaped opening in said wall bordered by side areas and a bottom area; a recess in at least one of said side areas; a scabbard portion having side walls and a bottom; and a projection outwardly disposed from at least one of said scabbard sides, said projection being so sized as to matingly engage said recess in said side area whereby said scabbard portion can be assembled into said base portion in a relatively rigid relationship.

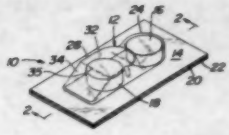
4,371,080

CHILDPROOF PACKAGE FOR MULTIPLE PRODUCTS

Russell R. Haines, Brielle, N.J., assignor to Paco Packaging Incorporated, Lakewood, N.J.

Filed Feb. 20, 1981, Ser. No. 236,420
Int. Cl.³ B65D *83/04, 85/42*
U.S. Cl. 206—531 **9 Claims**

1. A childproof package for plural products comprising a receptacle having an open side, said receptacle containing two products in remote spaced relation, said receptacle having an outwardly extending flange adjacent the open side, a tough closure layer sealed to said flange and closing said open side of said receptacle, said closure layer and receptacle being free from any slit or weakened portion provided to facilitate access to said products, means on the receptacle for moving one of the products therein toward the other product until they are sufficiently juxtaposed whereby the products cooperate to apply a combined force sufficient to rupture said closure layer



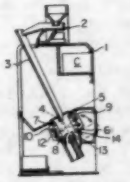
as the package is bent about an imaginary transverse line located between the juxtaposed ends of the products.

4,371,081

PHOTOELECTRIC SORTING DEVICE FOR COLOR SORTING APPARATUS

Toshihiko Satake, Higashi-Hiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 281,230
Claims priority, application Japan, Jul. 7, 1980, 55-93023
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—580 **2 Claims**



1. In a color sorting apparatus having a grain chute, a grain supplying device disposed at the upper end of said chute and adapted to supply grains of different colors to the upper end of said chute, and a grain sorting chamber disposed at the lower side of said grain chute, said grain sorting chamber accommodating a photoelectric sorting device including a pair of photoelectric chambers each incorporating a photoelectric detector, said photoelectric chambers being disposed so as to oppose to each other across the flow flux of said grains coming down from said chute and shielded by means of transparent window plates, said photoelectric sorting device further including an injection nozzle device adapted to blow air to blow away and separate the grains of different color in accordance with the detection signal from said photoelectric detectors,

an improvement in said photoelectric sorting device which comprises that at least one of said photoelectric chamber is rotatably mounted on the frame of said grain sorting chamber.

4,371,082

BICYCLE RACK

Richard J. Hostert, Cascade; Michael J. Mathiasmeier, Burlington, and Robert J. Gilbert, Sioux City, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 3, 1980, Ser. No. 203,532
Int. Cl.³ A47F *7/04*
U.S. Cl. 211—22 **5 Claims**

1. A bicycle rack comprising a base,

at least one support post attached to said base,

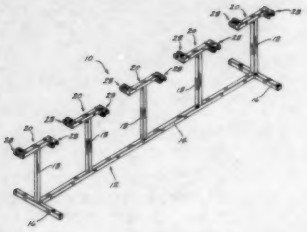
at least one approximately horizontally disposed fork bracket attached to each support post,

a horizontally disposed cross-bar attached to each support post,

two fork brackets being oppositely disposed and attached to each cross-bar,

said base including a center beam to which each support post is attached and which is in the same vertical plane as said cross-bar,

said fork bracket including two parallel disposed U-shaped members, each comprising a closed end, a first leg and a



second leg wherein said first and second legs are in the same vertical plane, whereby said first leg is the upper leg and said second leg is the lower leg, and wherein each of said U-shaped members is attached by each of said upper and lower legs to said cross-bar,

said U-shaped members including a vertically disposed reinforcing bar attached to said upper and lower leg at a point between said closed end and said cross-bar.

4,371,083

UNIVERSAL RACK FOR HOUSING TELECOMMUNICATION EQUIPMENT

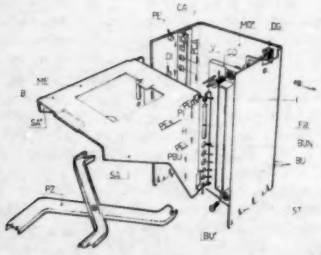
Carlo Zingrini, Milan, and Maurizio Oreglio, Bellinzago Lombardo, both of Italy, assignors to Telettra-telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Jun. 10, 1980, Ser. No. 158,292

Claims priority, application Italy, Jun. 12, 1979, 23474 A/79

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—26 **6 Claims**



1. In a universal rack for housing a wide range of subrack modules containing telecommunication equipment, power supplies and exchange cables, said rack comprising a vertical upright including connectors affixed thereto and at least two brackets, each bracket having a horizontal suspension base for the subrack modules and opposing side ribs each provided with notches for engagement with corresponding pins of the upright, the improvement comprising:

(a) said upright being U-shaped and including a base and two opposing sides extending normal thereto, with the free end of each side including a series of inwardly protruding pins regularly spaced a distance DI apart;

(b) each said bracket rib including, at the end engagable with said corresponding side free end, a vertical strip including an array of N holes in a lower portion thereof, and a slit thereabove, the diameter of said holes and said slit slightly exceeding the diameter of said pins and the number of holes N and the distance PBU between each of said holes being such that

$$DI = PBU(N+1)$$

while the distance H between topmost and the bottommost positions in the slit is

$$H = DI(1-2/N+1);$$

whereby each bracket can assume, over the distance DI, NP positions where NP=DI/N, and the number NM of subrack modules mountable between consecutive brackets are all those resulting from the combinations of the DI/N positions of each bracket on opposing side arms with respect to the successive ones.

4,371,084

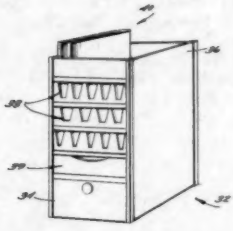
HAIR STYLING ACCOUTREMENTS

David Weinrauch, 1106 Harbormaster Shipyard, Hilton Head Island, S.C. 29928

Filed Jun. 9, 1980, Ser. No. 157,842

Int. Cl.³ A47F *1/12, 1/14*

U.S. Cl. 211—126 **4 Claims**



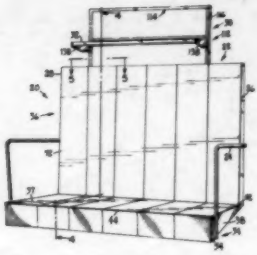
1. A device for dispensing rods each having a neck and head, in combination with a tray; said device comprising

a base; a pair of substantially parallel sidewalls substantially perpendicular to said base; a pair of lips integral with said sidewalls and extending substantially perpendicularly therefrom toward each other to define a channel therebetween, said channel having a width slightly greater than the diameter of a rod neck, and slightly smaller than the diameter of a rod head; said sidewalls extending a distance from the top of said base to the bottom of said lips at least as great as the length of a rod neck; said sidewalls, lips, and base defining an open front end so that a plurality of rods may be slid into and out of said device with each rod having a head engaging the tops of said lips adjacent said channel, and the rod necks extending into said device; a rear end wall opposite said open end covering substantially the entire area between said base, sidewalls, and lips; an extension of each of said lips adjacent said rear end wall an integral end termination of said channel adjacent said rear end wall; and a front end wall portion integral with said base and sidewalls and extending upwardly from said base a portion of height of said sidewalls to partially close said device open front end but having a top surface spaced from the bottom of said lips a distance at least as great as the length of a rod neck; and said tray having a bottom surface and a plurality of sidewalls, each sidewall of said tray having substantially the same height as the height of said front end wall portion, and said tray being dimensioned to snugly receive a plurality of said bases.

4,371,085
DISPLAY RACK

Howard J. Fredrickson, Cannon Falls, Minn., assignor to Cornelius Cannon, Inc., Cannon Falls, Minn.

Filed Jul. 22, 1980, Ser. No. 171,132
Int. Cl.³ A47F 5/13
U.S. Cl. 211—149 **11 Claims**



1. A display rack for standing on a floor and holding a quantity of consumer products, comprising:

bottom support means for providing bottom support for the quantity of said products, said bottom support means including a bottom support panel having a plurality of bends, said bottom support panel including an upper side for supporting said products, two sidewalls extending downwardly from the upper side and flanges extending inwardly from the sidewalls, said bottom support means further including a plurality of structural members extending between the upper side and the flanges for supporting the upper side, said flanges contactable with the floor for supporting said bottom support means on said floor;

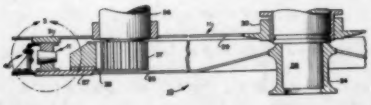
back support means for providing back support for the quantity of said products, said back support means including a back support panel having a plurality of bends, said back support panel including a forward side for supporting said products, two upright sides and a top side extending rearwardly from the forward side, said back support means further including an angle member extending between said upright sides, said top side and said angle member for holding said upright sides approximately parallel, said angle member also for supporting said back support means on said floor; and

means for attaching said bottom support means to said back support means including means for folding said back support means with respect to said bottom support means, whereby said folding means allows said bottom and back support means to be assembled and folded for convenient packaging and shipping.

4,371,086
SUPPORT STRUCTURES OF EXCAVATING MACHINES

Edwin W. Sankey, Marion, Ohio, and David J. Whittingham, Dallas, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 27, 1980, Ser. No. 163,635
Int. Cl.³ B66C 23/84
U.S. Cl. 212—253 **20 Claims**

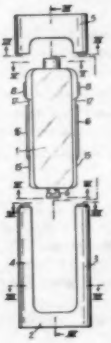


1. In an excavating machine having a lower frame, an upper frame and means for rotatably supporting said upper frame on said lower frame, an assembly for improving the loading condition of the upper frame supporting means comprising a first annular seal mounted on one of said upper and lower frames and disposed in wiping, sealing contact with the other of said upper and lower frames, a second annular seal mounted on one of said upper and lower frame and disposed in wiping, sealing contact with the other of said upper and lower frames, forming a sealed, annular chamber between said upper and lower and lower frames, and means for supplying air under pressure to said annular chamber to provide an upwardly directed force on said upper frame alleviating the load imposed on said upper frame supporting means.

4,371,087
PACKAGE FOR PERFUME PRODUCTS

Claude Saujet, Saint-Maurice, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Dec. 29, 1980, Ser. No. 221,363
Claims priority, application France, Jan. 2, 1980, 80 00001
Int. Cl.³ B65D 23/00, 23/08
U.S. Cl. 215—12 R **12 Claims**



1. A package for liquids, particularly for perfumery products, comprising:

a case having a lower base portion and two lateral parts upwardly extending from said lower portion;

a refill container;

bayonet-type locking means for locking said container in the base of said case, said locking means comprising

a projection extending from the bottom of said container, and

an opening of a corresponding shape in said base portion for accommodating said projection; and

means on said container and on the lateral parts of said case for:

(a) angularly positioning and vertically guiding the container during the introduction thereof into said case in a first angular orientation, in which said projection at the bottom of the container is in registration with and may be introduced into the opening of said base portion, and

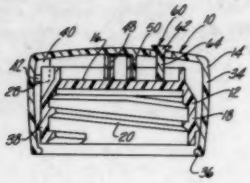
(b) elastically holding the container against axial and rotational displacement in said case in a second angular orientation in which said projection at the bottom of said container is locked in the opening of said base portion.

4,371,088

TAMPER INDICATING CHILD RESISTANT CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Sep. 10, 1981, Ser. No. 300,792
Int. Cl.³ B65D 55/02
U.S. Cl. 215—220 10 Claims



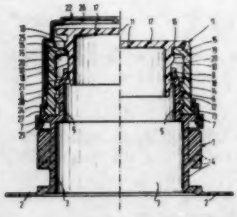
1. A tamper indicating child resistant closure for containers comprising: relatively rotatable inner and outer caps, said inner cap being internally threaded for engagement with threads on a container, a first set of engaging surfaces on said caps engageable with each other to turn said inner cap in a closing direction upon rotation of said outer cap in one direction, a second set of engaging surfaces on said caps operable to turn said inner cap in an opening direction upon simultaneous engagement of said surfaces and rotation of said outer cap in an opposite direction, said second set of engaging surfaces being engageable with each other only upon axial deflection of a part of said outer cap relative to said inner cap, an indicator element on said outer cap and connected thereto by frangible webs, said indicator element having a projecting portion in proximity to said inner cap when said part of said outer cap is not deflected and being engageable with said inner cap upon axial deflection of said part of said outer cap to break said frangible webs to separate said indicator element from said outer cap.

4,371,089

CONTAINER CLOSURE

Willem Barendregt, Baarn, Netherlands, assignor to Internationale Verpakking Maatschappij BV, Weesp, Netherlands

Filed Sep. 4, 1981, Ser. No. 299,387
Claims priority, application Netherlands, Sep. 8, 1980, 8005062
Int. Cl.³ B65D 55/02
U.S. Cl. 215—256 5 Claims



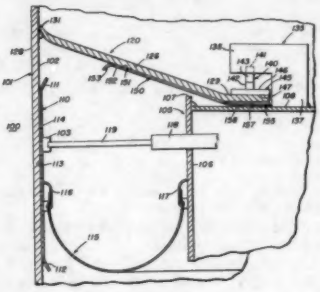
1. A closure for a container for packing fluids, said closure being provided with a neck having exteriorly positioned closure means and with a cap consisting of a cover portion and skirt portion with interiorly disposed closure means adapted for coaction with the neck closure means, while the cover portion is connectible with a single snap closure to the skirt portion, characterized in that the cap, in case of not yet connected skirt and cover portion, is entirely surrounded by a protective cap which prevents undesirable connection of skirt portion to cover portion, as well as receives the cap sealingly relatively to the surroundings.

4,371,090

SECONDARY SEAL FOR FLOATING ROOF STORAGE TANK

Bernard C. Ogarek, Park Ridge, and Milton W. Heisterberg, Flossmoor, both of Ill., assignors to GATX Tank Erection Corporation, Chicago, Ill.

Filed Nov. 3, 1980, Ser. No. 203,795
Int. Cl.³ B65D 88/46
U.S. Cl. 220—224 7 Claims



1. A floating roof storage tank comprising an upstanding cylindrical tank shell for containing a quantity of liquid to be stored, a floating roof within said tank shell adapted to float on the surface of the liquid within said tank shell, first sealing means extending between said floating roof and said tank shell and closing the space therebetween to provide a primary seal therebetween, a second sealing member secured to said floating roof and extending therebeyond and lying in sealing engagement with the inner surface of said tank shell to form a secondary seal between said floating roof and said tank shell, clamp means on said floating roof circumferentially spaced therearound for securing said second sealing member to said floating roof, said clamp means including removable wedges for wedging said second sealing member toward said floating roof, a sealant between said floating roof and said second sealing member providing a gas tight seal therebetween, and a plurality of fusible members in said second sealing member circumferentially spaced thereabout.

4,371,091

DOUBLE-SEAL MOLDED PLASTIC SCREW CAP

Robert P. Gelina, Vernon, Conn., assignor to Apollo Molded Products, Rockville, Conn.

Filed Jan. 21, 1981, Ser. No. 226,956
Int. Cl.³ B65D 41/04
U.S. Cl. 220—288 3 Claims

1. A double-seal molded plastic screw cap for use with a threaded-neck container of the type intended to hold a solid cosmetic product having a volatile ingredient, said screw cap comprising, in combination:

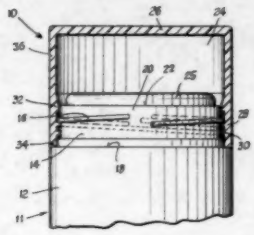
(a) a resilient cup-shaped plastic cap body having an annular side wall integral with a transverse top wall, said side wall having internal screw threads adapted for engagement with the external screw threads of the container neck,

(b) said side wall of the cap body having an annular sealing surface disposed above the internal screw threads and between the latter and the top wall, said sealing surface being slidingly and telescopically engageable with the outer annular surface of the container neck at the top rim thereof, to provide a first seal therewith,

(c) said annular side wall of the cap body having a perfectly flat downwardly-directed annular sealing surface on its bottom

edge for abutting engagement with a cooperable shoulder of the container neck to provide a second seal therewith,

(d) said annular sealing surfaces of the cap being spaced apart a distance equal to the spacing of the outer annular surface and cooperable shoulder of said container, thereby to effect simultaneous seals therewith,



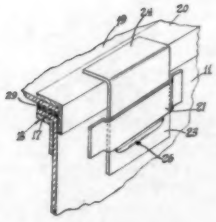
(e) the annular side wall of the cap extending upward to said top wall past the annular sealing surface therein, so as to provide a clearance chamber in which a portion of said cosmetic product can extend and be disposed.

4,371,092

WASTE CONTAINER WITH PERMANENT LID HOLD-DOWN ASSEMBLIES

Lyndon M. Teague, 1519 Chestnut St., Wilmington, N.C. 28401

Filed Oct. 29, 1981, Ser. No. 316,227
Int. Cl.³ B65D 45/16
U.S. Cl. 220—324 **7 Claims**



1. A waste disposal container comprising

(a) a metallic rectangularly spaced body having a bottom wall and side and end walls,

(b) means for reinforcing the exposed edges of said side and end walls,

(c) a metallic lid for said body,

(d) means reinforcing the peripheral edge of said lid,

(e) hold-down assemblies for the lid of the container including retaining members carried on the outer wall surface of said side and end walls,

(f) locking members each having a portion engaging said reinforced edge of said lid and another portion in contact with said retaining means and being held thereby in facial abutment with confronting surfaces of said walls so as to secure said lid in a closing relationship on said body,

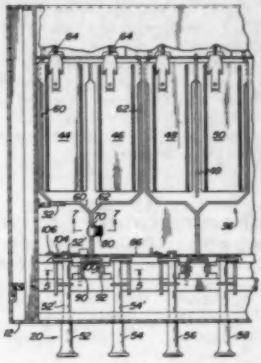
(g) and means on said locking member cooperating with said retaining member for permanently securing said locking member in contact with said lid in said container for permanently securing said lid onto the container.

4,371,093

VENDING MACHINE WITH CONVERTIBLE SHELVES

Martin M. Berger, 7711 Sycamore Ave., Elkins Park, Pa. 19117

Filed Apr. 14, 1981, Ser. No. 254,227
Int. Cl.³ B65H 31/20
U.S. Cl. 221—90 **8 Claims**



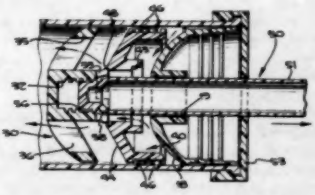
1. A vending machine comprising a housing containing horizontal pivotable shelves disposed side-by-side and adapted to support articles to be dispensed, a discrete dispensing operator coupled to each shelf for pivoting each shelf to attain a dispensing action, means for converting two adjacent shelves so that they function as a single shelf and for disabling one of the operators associated with said two adjacent shelves whereby the other operator can simultaneously effect dispensing from each of said two adjacent shelves.

4,371,094

BARRIER TWO PART PAIRING AND DISPENSING CARTRIDGE

Charles G. Hutter, III, Carson City, Nev., assignor to Products Research & Chemical Corporation, Glendale, Calif.

Filed Jul. 31, 1980, Ser. No. 174,117
Int. Cl.³ F04B 9/14
U.S. Cl. 222—1 **7 Claims**



1. A dual compartment container for separately storing two materials, subsequently mixing them, and later dispensing the mixture comprising:

a cylindrical body having a sealable orifice at each end thereof;

a barrier assembly disposed within the cylindrical body between the two ends for creating two separated compartments in the cylindrical body and capable of separating two materials, said barrier assembly having a sealing member having slidable, sealing contact with the inner wall of the cylindrical body and a dasher movable axially back and forth toward each of the ends to mix the material to be contained in the cylindrical body, the sealing member and the dasher being normally adjacent each other during the separate storing of the materials and during dispensing of the mixture; and wherein the improvement comprises:

said sealing member having means for releasably engaging and disengaging the dasher, said means comprising a central sleeve orifice and a circumferential locking shoulder;

said dasher having a means for releasably engaging and disengaging the sealing member, said means comprising a central core adapted for axial sliding engagement with the central sleeve orifice, and resilient locking members adapted to releasably engage the circumferential locking shoulder; and

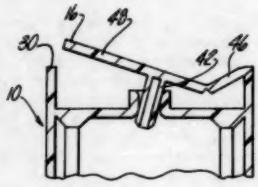
a means for moving the dasher comprising a rod attached to the dasher, said attachment allowing the rod to be positioned relative to the dasher in a first position which lockingly engages the dasher to the sealing member and in a second position which permits the dasher to be disengaged from the sealing member.

4,371,095

ONE-PIECE CHILD RESISTANT CLOSURE

Gary V. Montgomery, and Daniel P. McAlinden, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 2, 1981, Ser. No. 317,456
Int. Cl.³ B65D *47/08*
U.S. Cl. 222—153 **11 Claims**



1. A one piece child resistant closure for containers comprising: a cap member adapted to be permanently attached to a container and having a recess in its upper end, a cover member closing said recess in said cap member and formed integrally therewith for hinging movement about a first hinge at one edge, a dispensing orifice formed in said recess of said cap member and communicating with said container, plug means for said dispensing orifice moveable from a position in which said orifice is closed to a position to a position in which said orifice is opened upon swinging of said cover member about said first hinge to a fully opened position, a second hinge between said plug and said first hinge dividing said cover member into relatively foldable first and second portions, means forming a fulcrum for said second portion on a selected one of said member spaced from second hinge and adjacent said plug means, said second portion of said cover member being tiltable about said fulcrum while said plug means remain in a position closing said orifice during application of a pressing force to said cover member adjacent said second hinge to elevate an edge of said second portion from said recess to a lifting position, said lifting position permitting gripping of said second portion for swinging of said cover member about said first hinge to move said plug means and open said orifice.

4,371,096

CONTROL APPARATUS FOR PRESSURIZED GAS/LIQUID SYSTEMS

Charles H. Scholl, Vermilion, and Paul S. Frates, Brunswick, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

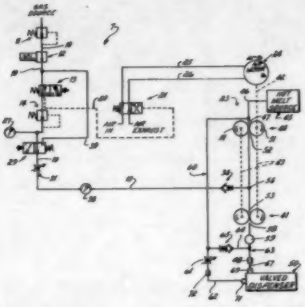
Filed Apr. 16, 1979, Ser. No. 30,461
Int. Cl.³ F04C *1/14, 15/04*
U.S. Cl. 222—190 **27 Claims**

1. Control apparatus for purging pressure in a system wherein a gas/liquid mixture is pumped under pressure, the system being of the type including a rotary pump which mixes the gas and the liquid together and delivers the mixture thereof under pressure through a conduit to a valved dispenser,

said control apparatus comprising,

a gas line for conveying said gas from a source to said pump,

a purge valve in said gas line selectively actuable to cut off the supply of said gas to said pump, and



means for reversing the direction of rotation of said pump to reverse the direction of flow of said mixture therethrough, said reversing means being responsive to the actuation of said purge valve,

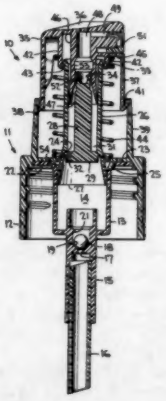
the reverse operation of said pump substantially reducing the pressure in said conduit.

4,371,097

LIQUID DISPENSING PUMP

Richard K. O'Neill, Hacienda Heights, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed May 7, 1980, Ser. No. 147,094
Int. Cl.³ B05B *11/00*
U.S. Cl. 222—321 **10 Claims**



1. A liquid dispensing pump, comprising a pump cylinder defining a pump chamber having a valved inlet opening, a reciprocable piston having an annular piston skirt at one end thereof in sliding engagement with the wall of said chamber between upstroke and downstroke positions of said piston, a discharge head for effecting downstroke movement of said piston, said discharge head having a discharge orifice, and a discharge passage extending through said piston and said head providing communication between said pump chamber and said orifice, said head being in sliding engagement with an

opposite end of said piston for limited relative inward and outward shifting movement of said head for opening and closing said discharge passage, said piston having a valve member at said opposite end in engagement with the wall of said discharge passage in said head during the closing of said discharge passage, and said valve member comprising a valve skirt forming an annular opening with an enlarged section in said wall during the opening of said discharge passage, whereby inward depression of said discharge head effects an opening of said passage and moves said piston into said downstroke position, liquid thereby being dispensed from said chamber through said passage and orifice.

4,371,098

ATOMIZER USABLE IN BOTH NORMAL AND INVERTED ORIENTATIONS

Takamitsu Nozawa; Takao Kishi, and Minoru Hinokiyama, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

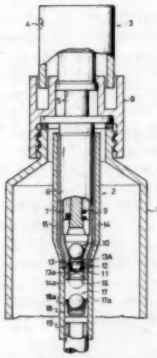
PCT No. PCT/JP79/00142, § 371 Date Jan. 11, 1980, § 102(e) Date Jan. 11, 1980, PCT Pub. No. WO80/00011, PCT Pub. Date Jan. 10, 1980

PCT Filed Jun. 6, 1979, Ser. No. 191,336

Claims priority, application Japan, Jun. 7, 1978, 53-77746[U]; Nov. 7, 1978, 53-153522[U]; Nov. 30, 1978, 53-164781[U]

Int. Cl.³ B05E *9/043*

U.S. Cl. 222—321 **9 Claims**



1. In an atomizer having an atomizing head, a first suction passage and associated first suction valve communicating with liquid in a liquid holding vessel, a discharge valve and a nozzle port for discharging liquid under pressure, and a pump mechanism including a cylinder means and a piston, said pump mechanism being adapted to be actuated by the vertical stroking of said atomizing head such that, when said atomizer head is moved upwardly, the pressure in a pressurizing chamber defined between said cylinder means and one end of said piston is decreased to a vacuum so as to allow a liquid to be sucked up from the vessel into said pressurizing chamber through said first suction passage and said first suction valve when said atomizer is operated in a normal orientation in which said atomizer is upright, while when said atomizing head is moved downwardly, a high pressure is established in said pressurizing chamber to forcibly open said discharge valve when the pressure in said pressurizing chamber has been increased beyond a predetermined level so as to allow said liquid to be atomized from said nozzle port in said atomizing head; the improvement comprising: a second suction passage extending upwardly inside the vessel from said first suction valve and communicating with the liquid in an inverted orientation of said atomizer; a second suction valve disposed in said second suction passage and adapted to open only when the pressure in said pressurizing chamber has been reduced down to a vacuum greater than a predetermined vacuum level, in the operation of said atomizer in said inverted orientation; and a check valve disposed in the first suction passage, said check valve being adapted to prevent air in said first suction passage from flowing into said pressurizing chamber when said atomizer is in the inverted orientation; and wherein said second suction valve is adapted to prevent air in said second suction passage from flowing into said pressurizing chamber when said atomizer is in the normal orientation.

4,371,099

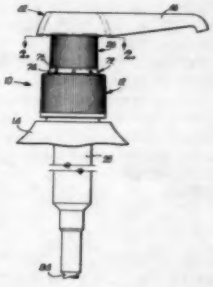
SIZE-COMPENSATING COLLAR IN A PUMP DISPENSER

Donald D. Foster, Kingsville, Mo., and Wallace F. Magers, Leawood, Kans., assignors to Realex Corporation, Kansas City, Mo.

Filed Nov. 18, 1980, Ser. No. 207,891

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—321 **7 Claims**



1. In a manually operated dispensing pump having a tubular body, an annular collar secured to one end of the body in axial registration therewith, and a plunger projecting through said collar and reciprocable within the body, the improvement comprising:

a flange on the exterior of said body spaced below said collar in disposition for abutting the underside of the top wall of a closure having an opening through which the pump may project when installed on the closure; and

a clamping element depending integrally from said collar in disposition for bearing against the topside of said top wall of the closure in forcible opposition to said flange when the pump is installed on the closure,

said collar being spaced a predetermined distance from said flange and said element being yieldably resilient away from the latter to the extent necessary to accommodate a variety of top wall thicknesses on a corresponding variety of closures while maintaining a clamping force against the same,

said collar including a radially inner skirt slidably receiving said plunger, a radially outer skirt having said clamping element at one extremity thereof, and a connecting portion adjacent the opposite extremity of the outer skirt joining the skirts to one another and having structure associated therewith for use in locking the plunger in a fully depressed position,

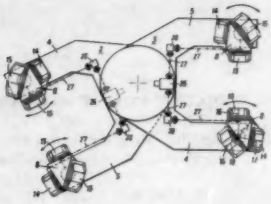
said connecting portion being inflexible relative to said element whereby yielding in the collar to accommodate closure thicknesses occurs in said element rather than said connecting portion and the locking structure.

4,371,100

ADJUSTABLE CARRYING-TOWER ARRANGEMENT FOR METALLURGICAL VESSELS

Gerhard Mühlbauer, Steyr, and Herbert Höller, Schwanenstadt, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 30, 1981, Ser. No. 229,953
Claims priority, application Austria, Mar. 5, 1980, 1203/80
Int. Cl.³ B22D *41/00*
U.S. Cl. 222—591 6 Claims



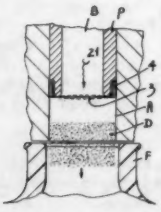
1. In a carrying-tower arrangement for a metallurgical vessel, in particular for a casting ladle of a continuous casting plant, of the type including a supporting column, at least one carrying arm projecting from said supporting column and having two supporting arms adapted for laterally encompassing said metallurgical vessel, carrying means provided on said metallurgical vessel, and supports arranged on said two supporting arms for said carrying means, the improvement which is characterized in that at least two supports are arranged on each of said two supporting arms, which at least two supports differ from one another, are exchangeable for one another, and into which the carrying means of differing metallurgical vessels are fittable.

4,371,101

FILTERING SCREEN FOR USE IN APPARATUS FOR THE DOSING OF POWDERED MATERIAL

Alessandro Cane, and Arrigo Farneti, both of Bologna, Italy, assignors to Zanasi Nigris S.p.A., Bologna, Italy

Filed Oct. 31, 1980, Ser. No. 202,659
Claims priority, application Italy, Oct. 31, 1979, 12799 A/79
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—636 4 Claims



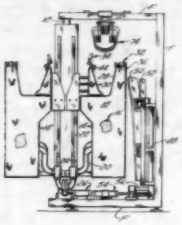
1. In an apparatus for dosing and dispensing finely powdered material employing an open-ended volumetric chamber adapted to receive a predetermined volume of powdered material, said chamber including a bottom wall located opposite to the open end being defined by a filtering screen, suction being applied through the screen to draw and compact powdered material into the chamber, and pressure being applied through the screen to discharge powdered material from the chamber, the improvement comprising said filtering screen being formed of a fabric of mono-filament synthetic material arranged as both the warp and weft of the fabric, and including securing means for clamping and tensioning the screen in relation to the chamber so that the screen is drawn taut over a portion of the securing means to define said bottom wall and vibrates to produce substantially constant deflection when acted upon by a pressurized jet of air.

4,371,102

TROUSER PRESSING APPARATUS

Wilhelm Engelbart, Sieben Hügel Nr. 5, 4800 Bielefeld, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,524
Claims priority, application Canada, Aug. 8, 1979, 333404
Int. Cl.³ D06F *71/28*
U.S. Cl. 223—73 4 Claims



1. A pants pressing apparatus, comprising an upstanding buck member and a buck element associated therewith, said member and said element being mounted for vertical movement between a lower unloading/loading position and a raised pressing position and for pivoted movement about a vertical axis, means on said member and said element for mounting and suspending a pair of pants from the waist/hip portion thereof, said element being mounted for transverse movement relative to said member for tensioning the waist/hip portion of the pants when suspended, means for retaining and gripping the pants with one leg on each side of said buck member, a pair of pressing means each including first and second pressing heads mounted on frame members movable into and out of pressing engagement with outer sides of the pant legs against said buck member, means for transversely moving said first heads relative to said second heads for tensioning the pants to thereby insure good creases, a pressing member for pressing the upper portion of the pants, said pressing member comprising a split head arrangement which is outwardly expandable into pressing engagement with an inner surface of the waist/hip portion of the pants upon movement of said buck member and said buck element into said raised pressing position, upper pressing heads movable into pressing engagement with said waist/hip portion against said split head arrangement, means for laterally moving said arrangement and said upper heads for pressing different sections of said waist/hip portion.

4,371,103

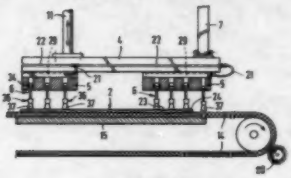
PROCESS AND APPARATUS FOR BREAKING OFF MARGINAL EDGE PORTIONS FROM A GLASS PANE

Walter Siemens; Günther Ulrich, both of Herzogenrath, and Karl R. Bartusel, Stolberg, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Paris, France

Filed Nov. 12, 1980, Ser. No. 206,253
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945682
Int. Cl.³ C03B *33/04*
U.S. Cl. 225—1 16 Claims

1. Process for breaking off the marginal edge of a glass blank outside of a score of a predetermined outline while the glass blank resides on a level, elastically resilient support and as the surface at least in the area outside of the score is placed in a condition of bending stress by a lowerable tool characterized in that singly and resiliently mounted pressure pins are lowered

onto the surface of the glass at a slight distance from one another in such a way that a higher surface pressure is applied to the lateral strip outside of the score by a greater number of pressure pins than is applied to the glass pane inside of the



score, which application of pressure at the same time deforms the elastically resilient support through a bending of the lateral strip outside of the score more strongly than inside of the score to thus place the surface provided with the score under a tensile stress causing the lateral strip to break along the score.

4,371,104

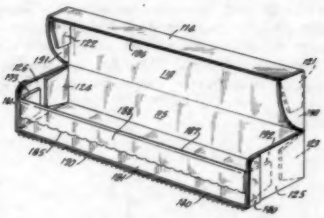
DISPENSER BOX WITH CUTTING EDGE

Ralph J. Korte, Darien, Ill., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 227,685, Jan. 23, 1981, abandoned. This application Jun. 4, 1981, Ser. No. 270,486

Int. Cl.³ B26D *1/02*

U.S. Cl. 225—48 **6 Claims**



1. A generally rectangular carton formed from a single blank of paperboard material, said carton for storing and dispensing a roll of sheet material, said carton comprising:

substantially identical rectangular top and bottom walls disposed in parallel relationship, said top and bottom walls each having first and second opposed side edges and opposed end edges;

substantially identical rectangular first and second side walls disposed in parallel relationship, said first and second side walls each having first and second opposed side edges and opposed end edges, said side edges of said first and second side walls and said side edges of said top and bottom walls being of equal length, said first side edges of said first and second side walls being foldably connected to the first side edges of said top and bottom walls respectively, said second side edges of said first and second side walls being foldably connected respectively to said second side edges of said top and bottom walls, at least a portion of said first side wall and the portion of said bottom wall adjacent said first side wall being formed by a plurality of layers of said paperboard material secured together and disposed in face-to-face relationship;

first and second end walls foldably connected to and extending between said top, bottom and side wall end edges, at least a portion of said end walls being formed from a plurality of layers of said paperboard material secured together and disposed in face-to-face relationship; and

a relatively stiff reinforcing strip having a serrated edge, said strip being affixed at least to the portion of the bottom wall adjacent said first side wall and being folded and secured in face-to-face relationship with at least a portion of both said end walls, said strip and said plurality of layers of said paperboard material in said first side wall, said bottom wall and said end walls cooperating to reinforce said carton and to prevent warping, distortion or tearing of said carton.

4,371,105

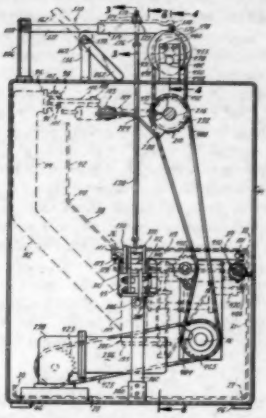
CAM CONTROLLED MULTI-AXIS AUTOMATIC WELDING MACHINE

Vernon L. Melton, 1600 W. Main St., Washington, Mo. 63090

Filed Jul. 23, 1980, Ser. No. 171,453

Int. Cl.³ B23K *37/02, 9/12*

U.S. Cl. 228—7 **16 Claims**



3. A welding machine which comprises a mount for a welding torch, a first cam, a first cam-responsive means intermediate said first cam and said welding torch which can effect rotation of said welding torch about an axis, a second cam, a second cam-responsive means intermediate said second cam and said axis which can effect vertical movement of said welding torch while permitting rotation of said welding torch about said axis, a third cam, a third cam-responsive means intermediate said third cam and said axis which can effect forward-rearward movement of said axis and hence of said welding torch while permitting rotation of said welding torch about said axis, a fourth cam, a fourth cam-responsive means intermediate said fourth cam and said axis which can effect lateral movement of said axis and hence of said welding torch while permitting rotation of said mount about said axis, each of said four cam-responsive means having a plurality of members, each of said members being resistant to bending and remaining substantially free of bending throughout the operation of said welding machine, a first member of the plurality of members of each of said four cam-responsive means being rotatable about an axis of rotation and receiving a driving force from a second member of said plurality of members that is pivotally secured to said first member, said first member responding to said received driving force from said second member to apply a driving force to a third member of said plurality of members which is pivotally secured to said first member, a movable work-holding fixture which is adapted to hold and move a workpiece relative to said welding torch, and mechanical means that physically synchronize the movement of said movable work-holding fixture with movement of said cams.

14. A machine wherein a member can be moved relative to a second member, and which comprises a mount for one of said members, a first cam, a first cam-responsive means intermediate said first cam and said mount which can effect a desired

movement of said mount, and hence of said one member, relative to the other of said members, a second cam, a second cam-responsive means intermediate said second cam and said mount which can effect a different desired movement of said mount, and hence of said one member, relative to said other member, a third cam, a third cam-responsive means intermediate said third cam and said mount which can effect a further desired movement of said mount, and hence of said one member, relative to said other member, each of said cam-responsive linkages having a plurality of members, and each of said members being resistant to bending and remaining substantially free of bending throughout the operation of said machine, a first member of the plurality of members of each of said cam-responsive linkages being rotatable about an axis of rotation and receiving a driving force which is eccentric of said axis of rotation and which is applied by a second member of said plurality of members that is pivotally secured to said first member, said first member responding to said received driving force from said second member to provide a driving force which is eccentric of said axis of rotation and which is applied to a third member of said plurality of members that also is pivotally secured to said first member, means to drive said first, second and third cams, a movable work-holding fixture which is adapted to hold and to move a workpiece, a first frame that is movable laterally to effect lateral movement of said axis, a second frame that is movable forwardly and rearwardly to effect forward-rearward movement of said axis, a third frame that is movable vertically to effect vertical movement of said welding torch, said first member of each of said cam-responsive means being bodily movable with one of said frames, said second member of each of said cam-responsive means being an elongated member and extending from the cam for said cam-responsive means to said first member of said cam-responsive means, whereby any influence which one cam-responsive means could have on any other cam-responsive means is not material.

15. A welding machine which comprises a mount for a welding torch that is movable in a plurality of directions to permit movement of said welding torch in said plurality of directions, a plurality of cams which can supply forces to move said welding torch in said plurality of directions, a plurality of cam-responsive linkages intermediate said cams and said mount for said welding torch which can respond to said forces supplied to said cams to move said welding torch in said plurality of directions, said cams being remote from said mount and from said welding torch, and adjusting means in said cam-responsive linkages which can adjust the position of said welding torch, all of said adjusting means being readily accessible to an operator of said welding machine while said operator is in a position to view said welding torch, whereby said operator can adjust said adjusting means while viewing said welding torch.

4,371,106

METHOD OF AND STAND FOR DISASSEMBLING STRUCTURES SUCH AS RADIATORS

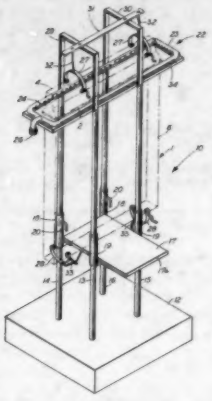
Robert M. Chapman, R. D. 1, Box 1040, Mohnton, Pa. 19540

Filed Oct. 15, 1980, Ser. No. 197,153

Int. Cl.³ B23K *3/04, 1/18*

U.S. Cl. 228—19 **10 Claims**

1. A disassembly stand for disassembling a structure by separation of first and second parts that are joined together by a meltable bonding medium comprising: (A) a frame; (B) heating means mounted to said frame and configured to substantially simultaneously direct heat along a major extent of a junction between said first and second parts; (C) suspension means carried by said frame for suspending said structure by said first part with said junction in alignment with said heating means; and (D) means for causing opposing forces to act upon first and second parts while said structure is suspended by said suspension means and the junction heated, wherein said means for causing comprises a vertically adjustable platform means for receiving said structure in a first, lower position, for supporting said structure during mounting thereof to said suspension means in a second, raised position, and for shifting the



weight of said structure to said suspension means in a third, intermediate position between said first and second positions.

4,371,107

WELDING MACHINE

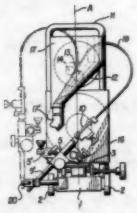
Toshihiko Watanabe, Kamakura; Naoki Takeuchi, Chigasaki; Soichi Tsuruga, and Tadatsugu Koishi, both of Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 89,740, Oct. 31, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,082

Claims priority, application Japan, Oct. 31, 1978, 53-134994

Int. Cl.³ B23K *9/12, 37/02*

U.S. Cl. 228—32 **7 Claims**



1. A welding machine comprising:

a wheeled platform movable along a predetermined path and having a longitudinal center line and sides lateral to said path;

a torch support fixed to said platform;

a welding torch movably supported by one end of said torch support for movement into at least one welding position on each of said lateral sides;

a coiled wire reel rotatably fixed to said platform and rotatable about an axis contained in a vertical plane passing through said center line;

wire supply means fixed to said platform above said reel and disposed about said vertical plane and composed of a wire supply drive mechanism, a supply roll located on said vertical plane and a pressure roll positionable against said supply roll;

a rotatable wire corrector affixed to one end of said torch; and

a flexible and substantially nonexpansive wire guide connecting said wire supply means and said wire corrector,

whereby the mounting of said wire supply means to said platform above said reel and disposed about said vertical plane enhances the stability of said machine in any welding position.

4,371,108

METHODS OF MANUFACTURING LARGE TUBULAR COLUMNS

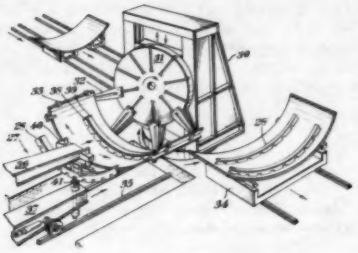
Stephen Roggendorff, and Cuthbert J. Walker, both of 1 Cricketers Parade, Worthing, West Sussex, BN14 9DB, England

Filed Sep. 19, 1980, Ser. No. 188,751

Claims priority, application United Kingdom, Aug. 9, 1980, 8026041

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—173 C **11 Claims**



1. A method of manufacturing tubular members in which metal plate is rolled into a plurality of shell segments of arcuate cross-section, in which each of said rolled shell segments is transported to a first positioner having clamping means mounted on a circular plate which is rotatable about a horizontal axis in a tower body which is itself rotatable about a vertical axis, in which a plurality of metal stiffening ring segments of arcuate cross-section are welded to the concave surface of each of said rolled shell segments to form stiffened shell segments, the angular extent of each of the ring segments being less than that of each of the the shell segments so that a space is left at each end of each of the rolled shell segments which is free from ring segments, in which a plurality of stiffened shell segments are assembled and welded together to form a tubular section, and in which a plurality of said tubular sections are assembled coaxially end-to-end and welded together to form a longitudinally extending tubular member.

4,371,109

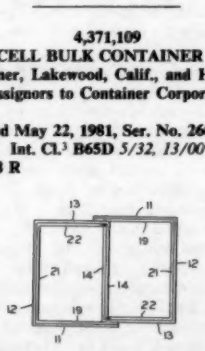
TWO-CELL BULK CONTAINER TUBES

Donald M. Tanner, Lakewood, Calif., and Herbert M. Potts, Yulee, Fla., assignors to Container Corporation of America, Chicago, Ill.

Filed May 22, 1981, Ser. No. 266,497

Int. Cl.³ B65D *5/32, 13/00*

U.S. Cl. 229—28 R **2 Claims**



1. Two-cell bulk container tubes for a fungible product such as grain comprising:

(a) a pair of congruent tubes adjacent to each other, each being formed from four hingedly connected walls to provide a first inner side wall, opposed outer end walls and an outer side wall;

(b) said opposed outer end and said outer side walls being laminated at the insides thereof to second outer walls conforming to said opposed outer end walls and said outer side wall;

(c) said first inner side walls being laminated together to define a pair of longitudinal cells each having double thickness outer walls and a double thickness common inner wall, the outer surfaces of said first inner side walls being disposed in face-to-face relation to each other; and

(d) one of the longitudinal end outer walls of each tube extending in overlying relationship with the laminated outer end wall of the opposite longitudinal end of the adjacent tube and being laminated together to provide a manufacturer's joint composed of four laminae at each longitudinal end of said tubes to give good stacking strength of said tubes when loaded with a fungible product.

4,371,110

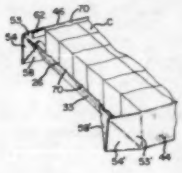
SHEET CAKE TRAY CARTON

Francis V. Kulig, Morris, Ill., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Mar. 11, 1981, Ser. No. 242,438

Int. Cl.³ B65D *5/24*

U.S. Cl. 229—31 FS **4 Claims**



1. A container structure for handling a bakery product in the form of a sheet cake which is to be divided into serving portions after being baked in a conventional baking oven, decorated and cut without removal from the container, said container structure comprising a relatively shallow depth tray structure which is dimensioned to accommodate a sheet cake of substantial size, said tray structure being formed from a cut and scored blank of paperboard having a film coating enabling it to withstand conventional baking oven temperatures without destruction, said tray structure comprising a bottom wall forming panel and upstanding peripheral side and end wall forming double thickness panels with integral foldable corner connecting web structures, said side wall panels comprising an outer panel and an inner panel foldable about a top edge forming score line and adhesively secured to the inside face of said outer panel, said end wall forming panels comprising an outer panel integrally connected at its opposite ends to the adjacent ends of said side wall forming outer panels by said foldable web structure, said web structure each comprising a pair of integral triangular web portions foldable upon each other and against the inner face of the outer end wall panel, said side wall forming inner panels each having at opposite ends small locking recesses adjacent the inner bottom corners, and said inner end wall forming panels each having at its inner bottom corners bendable locking tab elements which are contoured and dimensioned to fit in said locking recesses, said inner end wall forming panels having hinged marginal strips adapted to be positioned on the inner face of the bottom wall forming panel and extending along a hinge line, said end wall forming outer panels having diagonal scores at each end extending from the bottom hinge line to an end wall top edge forming score line about which said inner and and outer end wall panels are folded forming said double thickness end walls and thereby

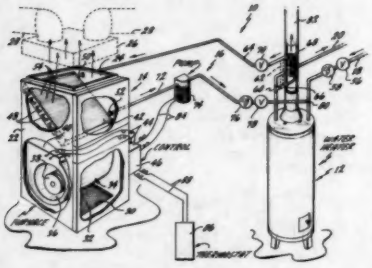
entrapping said foldable web structure therebetween when said container structure is erected, said end wall top edge forming score lines having the terminal portions thereof perforated to form readily torn terminal fold portions for readily releasing said foldable web structure entrapped between the ends of the inner and outer end wall panels and thereby freeing the end and side walls for downward hinging movement to provide ready access to the end portions of the product.

4,371,111

HOME HEATING SYSTEM EMPLOYING WATER HEATER AS HEATING SOURCE

Richard J. Pernosky, 2001 Fairoaks, South Pasadena, Calif. 90130

Filed Jun. 24, 1980, Ser. No. 162,401
Int. Cl.³ F24D *3/00*
U.S. Cl. 237—8 R **6 Claims**



1. A heating system including an air distribution system and a water heater having a cold water inlet and a hot water outlet which comprises:

a housing;

said housing including an air inlet opening and an air outlet opening, said air outlet opening sized and shaped to mate with and form an essentially airtight connection with said air distribution system, said air inlet opening sized to allow a volume of air to be drawn into said housing;

a first heat exchanger means located within the interior of said housing and capable of receiving a stream of hot water and transferring at least a portion of the heat content of said stream of water to a volume of air present within the interior of said housing;

said first heat exchanger means including water inlet means and water outlet means, said stream of hot water entering said first heat exchanger means at said water inlet means and being discharged from said first heat exchanger means at said water outlet means;

a blower means located within the interior of said housing and capable of moving a volume of air within the interior of said housing between said air inlet and outlet openings and contacting said moving volume of air with said first heat exchanger means such that the transfer of said heat from said stream of hot water to said volume of air within the interior of said housing is affected and after said heat is transferred to said volume of air to force said volume of air through said air distribution system;

a hot water conduit means connected between said water inlet means of said first heat exchange means and said hot water outlet of said water heater and capable of conducting a stream of hot water from said water heater to said first heat exchanger means;

a water return conduit means connected between said water outlet means of said first heat exchange means and said cold water inlet of said water heater and capable of returning water discharged from said first heat exchanger means to said hot water heater;

a pump means operatively connected to one of said hot water conduit means or said water return conduit means and capable of forcefully moving water through a pathway comprising said hot water conduit means, said first heat exchanger means, and said water return conduit means;

said water heater being of the type wherein a fuel is combusted within a burner to heat said water in said water heater and including a flue leading from the burner of said water heater to the atmosphere;

a second heat exchanger means located so as to form a portion of said hot water conduit means and positioned within said flue and capable of extracting heat from combustion gases passing through said flue from said burner to the atmosphere and

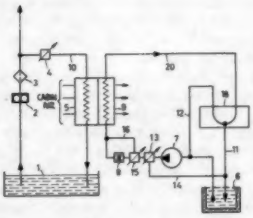
said blower means comprising a fan means and an electric motor operatively attached to said fan means and capable of activating said fan means to transfer said volume of air whereby water heated by said burner in said hot water heater first passes from said hot water heater to said second heat exchanger means for supplemental heating prior to passing through said first heat exchanger means.

4,371,112

AUXILIARY AIR HEATER

Paul Tholen, Gladbach, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,573
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005966
Int. Cl.³ B60N *27/00*
U.S. Cl. 237—12.3 A **8 Claims**

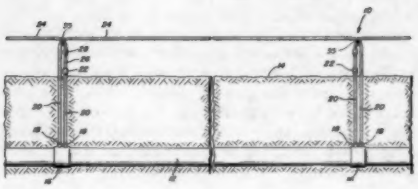


1. An arrangement for heating the operator's cabin of a motor vehicle, comprising a liquid circulation system of the vehicle including a liquid medium for cooling or lubricating the engine, means for circulating the liquid medium through the circulation system, a main heating circuit in said circulation system including a main heat exchanger for heating air by indirect heat exchange with the liquid medium that is heated by engine heat generated by the engine, valve means in said circulation system for controlling the rate of liquid medium flow to the engine for cooling or lubricating or to said main heat exchanger for heating the air, whereby to assure an adequate quantity of liquid flow required for said circulation system and to make available a sufficient quantity of liquid flow through said main heating circuit for heating purposes, an auxiliary heating circuit containing an auxiliary stream of liquid medium and having a hydraulic pump for delivering the auxiliary stream through the auxiliary circuit via a pressure-reducing element to an auxiliary heat exchanger, the pressure of the auxiliary stream through said element being converted into heat for increasing the temperature of same, said heat exchangers being connected in series relative to the flow of air therethrough with said auxiliary heat exchanger being arranged on the downstream side of said main heat exchanger.

4,371,113
IRRIGATION SYSTEM

Woodrow M. Ross, 1863 Algodon Rd., Marysville, Calif. 95901

Filed Sep. 16, 1980, Ser. No. 187,979
Int. Cl.³ B05B *15/06*
U.S. Cl. 239—201 8 Claims



1. An irrigation system for delivering irrigation water to a desired location, said system comprising: main water supply means; conduit means attached to said main water supply means for directing said irrigation water therefrom; coupling means for connecting said conduit means to said main water supply means; distribution means for receiving said irrigation water directed from said main supply water means, said distribution means including an emitter conduit means having orifices therein for distributing said irrigation water to said desired location, said emitter conduit means further having two ends, both of said ends being in communication with said main water supply means, said main water supply means comprising sections of plastic irrigation pipe, said plastic irrigation pipe having male and female ends thereon so as to effect a double-walled connection between said sections, said main water supply means being substantially buried beneath a ground surface, said coupling means for connecting said conduit means to said main water supply means including at least one aperture extending through said double-walled connection of said main water supply means, said aperture having a nipple means fixedly attached therein, said conduit means being fixedly secured to said nipple means to thereby effect a communication between an interior portion of said main water supply means and said conduit means, said double-walled connection serving to rigidly support said nipple means and said conduit means attached thereto, said conduit means and said nipple means being constructed of PVC pipe, said conduit means further including a separable extension means attached thereto, said extension means serving to fluidly connect said conduit means with said distribution means, said extension means being fixedly secured between said distribution means and said conduit means through the use of additional nipples, said additional nipples and said extension means all being constructed of PVC material, an additional aperture being provided in said double-walled connection thereby to provide for a second conduit means to be attached to a second nipple means fixedly secured thereto, said second conduit means being fluidly connected to a second distribution means, said first and second distribution means being in an abutting relationship so as to mutually support each other in a position above said ground surface.

4,371,114
SPRAYING GUN

Vilmos Weiperth, and Tibor Lezsak, both of Budapest, Hungary, assignors to Chemokomplex Vegyipari Gepes Berendezes Export Import Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 101,189, Dec. 7, 1979, abandoned, which is a continuation of Ser. No. 954,458, Oct. 25, 1978, abandoned, which is a continuation of Ser. No. 702,842, Jul. 6, 1976, abandoned. This application Sep. 2, 1980, Ser. No. 182,985
Int. Cl.³ A62C *13/40*
U.S. Cl. 239—309 5 Claims

1. A spraying gun for atomizing liquid substances, comrpising, in combination: an elongated tubular body having at one end thereof a compressed gas cartridge receiving closure head; and at the other end a gun head with an atomizer, a regulating valve, and means for operating said valve; a freely movable elastic partition member which divides said tubular body into a gas and liquid tight gas space and an adjoining, separate liquid and gas tight liquid space; threaded gas and liquid tight connections and sealing members between said tubular body, on the one hand, and each of said closure and said gun heads, on the other hand; a safety valve in said closure head which optionally releases the pressure from at least said gas space; wherein said partition member is in the form of a piston that has at least one front surface provided with a threaded blind bore for removably receiving a manipulating rod therein; wherein said operating means is intermediate along the geometric axis of the gun between said atomizer and said valve, and includes a laterally protruding, pivotable long handle that allows fine regulation of said valve when manually engaged at its free outer end; and wherein said tubular body, said liquid space, said gun head, said valve and said atomizer are substantially coaxial with the geometric axis allowing discharge of the liquid with a minimum of frictional resistance along its path.

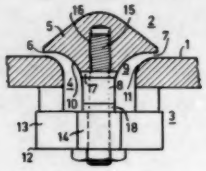
4,371,115
RING-GAP NOZZLE

Franz Sedlacek, Weingarten, Fed. Rep. of Germany; Jakob Oertle, Winterthur, and Dietrich Cebulla, Lucerne, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 22, 1979, Ser. No. 13,918
Claims priority, application Switzerland, Mar. 1, 1978, 22017/82
Int. Cl.³ B05B *1/26*
U.S. Cl. 239—524 9 Claims

1. In a ring gap nozzle for distributing a fluid medium over a plate and comprising an axial channel through the plate; a cap

covering the channel and spaced from the plate to define a ring gap having an exit which opens radially outward and is free of obstructions; means affixing the cap to the plate including a connecting member which is coaxial with the channel and holds the cap on a clamp member carried by the plate; and means defining an annular flow path through the nozzle including an axial portion in the channel through which said fluid medium enters the nozzle, a deflection portion in which fluid medium delivered through the axial portion is deflected

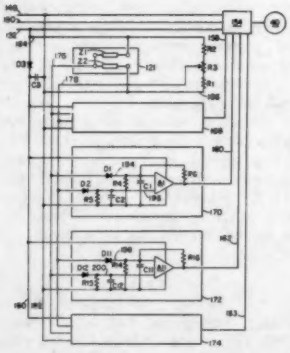


and directed radially outward, and a rotationally symmetrical guiding portion which leads fluid medium from the deflection portion to the exit of the ring gap, the improvement wherein said annular flow path is bounded in part between curved, rotationally symmetrical walls, one of which is a wall of said cap; and wherein at least that part of the annular flow path including said deflection and guiding portions has a flow area which decreases continuously in the direction of flow of said medium.

4,371,116
VARIABLE REACTANCE ALIGNMENT DETECTOR AND CONTROL

David M. Sage, 819 High St. #210, Bellingham, Wash. 98225, and George E. Sage, 22002 Redmond-Fall City Rd., Redmond, Wash. 98052

Division of Ser. No. 893,345, Apr. 4, 1978, abandoned, and a continuation of Ser. No. 151,166, May 19, 1980, Pat. No. 4,266,732, which is a continuation of Ser. No. 893,345, Apr. 4, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,549
Int. Cl.³ B05B *3/00*
U.S. Cl. 239—720 **9 Claims**



1. An alignment sensor for use in monitoring the angular relationship between two articulating members having a variable angular relationship with respect to each other, and which is sensitive to angular misalignment of the two members in a first plane which contains the members when aligned and relatively insensitive to angular misalignment in a second plane normal to the first plane which also contains the members when aligned; comprising, at least one variable inductance element which includes:

(a) one inductive coil;

(b) a first core element connected to the first member for movement with the member, forming a segment of a flux path for the coil and supporting the coil, including:

(1) a central element on which the coil is mounted and

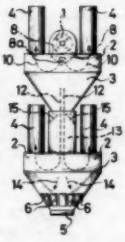
(2) a pair of elongated, lateral elements connected to the central element on opposite sides of the coil, each lateral element having its longitudinal axis parallel to the plane to which the insensitivety is desired and normal to the plane in which the sensitivety is desired and wherein the length of said lateral elements is substantially greater than the dimension of a second core element in the longitudinal direction of the lateral elements; and

(c) said second core element connected to the second member for movement with the member, positionable relative to the first core element to form with the first core element a complete flux path for the coil and defining variable air gaps between the first and second core element so that variations in alignment of the members move the core elements relative to one another to vary the size of the air gaps to vary the inductance of the coil.

4,371,117
PRODUCTION OF POWDERED SUGAR

Andreas von Bennigsen-Mackiewicz, and Christoph von Bennigsen-Mackiewicz, both of 17, Mühlenstrasse, 3211 Banteln, Fed. Rep. of Germany

Continuation of Ser. No. 53,170, Jun. 29, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 248,751
Int. Cl.³ B02C *23/20*
U.S. Cl. 241—18 **11 Claims**



1. A process, for the production of dried powdered sugar, comprising:

(i) providing a powdering device,

(ii) placing refined sugar in crystalline state in said powdering device,

(iii) reducing the crystalline sugar to powder by operation of the powdering device,

(iv) passing the powdered sugar directly and downwardly from the powdering device into a fluidizing chamber having filtration walls adapted to permit passage therethrough of air but not of powdered sugar,

(v) retaining the powdered sugar suspended in the fluidizing chamber for a dwell period and, whilst said powdered sugar is in said chamber, passing air into said powdered sugar to cause it to be dried whilst being fluidized therein, the duration of the dwell period being selected to ensure total drying of the powder,

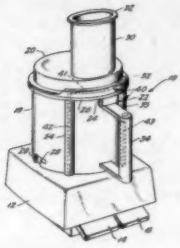
(vi) temporarily terminating the passage of drying air into the fluidizinig chamber, and

(vii) whilst the passage of air is temporarily terminated, removing the dried powdered sugar from the fluidizing chamber.

4,371,118
MAGNETIC SAFETY INTERLOCK METHOD AND APPARATUS FOR FOOD PROCESSOR

Carl G. Southeimer, Greenwich, Conn., and Allen F. Podell, Palo Alto, Calif., assignors to Cuisinarts, Inc., Greenwich, Conn.

Filed Jun. 2, 1980, Ser. No. 155,200
Int. Cl.³ B02C *18/16*
U.S. Cl. 241—30 33 Claims



1. In a food processor of the type including tool drive means located in a base with control means for rendering the tool drive inoperative unless said control means is actuated, a bowl mountable on said base for enclosing a rotatable tool within said bowl, a removable cover for said bowl, a food-receiving hopper extending through the cover for feeding food items through the cover into the bowl to a tool rotatable by said tool drive means, and a food pusher manually insertable into said hopper for pushing the food items in said hopper toward the rotating tool, protective interlock apparatus comprising:

first magnetic means associated with the cover,

said first magnetic means becoming positioned in a predetermined position when the bowl is mounted on the base in proper position and when the cover is in proper position on the bowl,

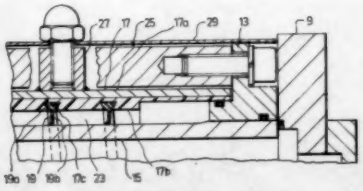
second magnetic means in the base coupled with said control means for actuating said control means for rendering the tool drive operative only when said first magnetic means has become positioned in said predetermined position, and

discriminating means associated with said second magnetic means for preventing actuation of said control means except by the intended first magnetic means.

4,371,119
AGITATOR-TYPE BALL MILL

Albert Leuthold, Basel, Switzerland, assignor to Willy A. Bachofen AG, Basel, Switzerland

Filed Jan. 14, 1980, Ser. No. 111,992
Claims priority, application Switzerland, Jan. 18, 1979, 477/79
Int. Cl.³ B02C *17/18*
U.S. Cl. 241—66 18 Claims

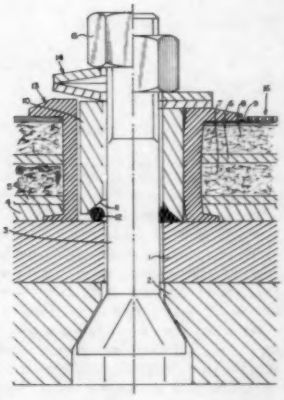


1. An agitator-type ball mill, comprising a circumferential wall which bounds a working chamber having an axis, said wall including two radially spaced jackets which form therebetween a gap in which a heat-exchange and a cleaning medium can be received and in which a deposit of foreign material tends to form; means for releasably connecting said jackets with one another and arranged so that said jackets can be separated from each other by displacement in an axial direction; and means for forming a substantially helical passage in said gap including a member which is connected with one of said jackets and extends in said gap to the other of said jackets, said member being elastic and shaped so that when the heat-exchange medium is supplied into said gap in one axial direction said member due to the elasticity of said member abuts against said other jacket and thereby maintains said helical passage, whereas when a cleaning medium is supplied in said gap in another axial direction which is opposite to said one direction said cleaning medium lifts said member from said other jacket thereby facilitating removal of the foreign material deposits.

4,371,120
PARTICLE GRINDER WITH HIGH DEGREE OF SOUND ISOLATION

Jean P. Grapin, Frontignan; Gilbert Gauthier, Belmont, and Francis Deltruc, Lozanne, all of France, assignors to Ciments Lafarge France, Saint-Cloud, France

Filed Dec. 3, 1980, Ser. No. 212,592
Claims priority, application France, Dec. 3, 1979, 79 29686
Int. Cl.³ B02C *17/18*
U.S. Cl. 241—284 7 Claims



1. In a particle grinder apparatus including a rotatable container for crushing materials inserted therein, the improvement comprising:

said container having at least one opening in a wall thereof,

sound insulation means covering a major portion of the exterior surface of the wall of said container,

elongated fastening means including an elongated stationary part and a movable part engaged thereon, said elongated part passing through said opening and through said sound insulation means and being operable for fastening said sound insulation means to said container,

a first sleeve at least partially surrounding said elongated fastening means within a region adjacent said opening,

a resilient second sleeve at least partially surrounding said first sleeve and including external flanges, said sound insulation means abutting said flanges of said second sleeve,

resilient sealing means disposed around a portion of said elongated part of the fastening means, and between said first sleeve and said container, and

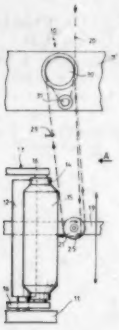
elastic means disposed between said sleeves and said movable part of said fastening means, whereby, upon said movable part being tightened on said elongated part, said

second resilient sleeve is compressed substantially in an axial direction by said elastic means, thereby establishing at least partial contact between an exterior peripheral portion of said first sleeve and an interior peripheral portion of said second sleeve, and sound-proofing said opening.

4,371,121
YARN WINDING DEVICE

Horst Feiler, Ebersbach, and Gunter Konig, Uhingen-Baiereck, both of Fed. Rep. of Germany, assignors to Zinser-Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,452
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028826; Jun. 5, 1981, 3122385
Int. Cl.³ B65H *54/02, 54/28*
U.S. Cl. 242—18 DD **18 Claims**



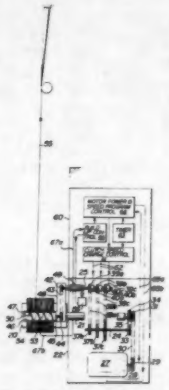
1. A high speed yarn winding device for forming a parallel winding for yarn windings which intersect within each winding layer, the device comprising a yarn winding body means for receiving the yarn, means for interchangeably and rotatably carrying the winding body means, means for directly supplying yarn to the winding body means, guide means displaceable in parallel to an axis of rotation of the winding body means, and wheel means rotatably mounted on the guide means for deflecting the yarn to the supplying means so as to superimpose rapid and short modulating strokes on the displacement of the guide means to wind the yarn into the parallel winding, characterized in that the wheel means includes at least one round driving surface means arranged concentric to an axis of rotation of the wheel means for enabling the yarn to drive the wheel means, and at least one yarn deflecting element is disposed eccentrically on the wheel means, and in that yarn transport means are for driving the wheel means and for feeding the yarn to the at least one yarn deflecting element.

4,371,122
METHOD AND APPARATUS FOR WINDING STRAND MATERIAL AND PACKAGE

Marius C. Schuller, Guelph, Canada, assignor to Fiberglas Canada, Inc., Ontario, Canada

Filed May 8, 1980, Ser. No. 147,729
Claims priority, application Canada, Feb. 29, 1980, 346760
Int. Cl.³ B65H *54/08, 54/28, 55/00*
U.S. Cl. 242—43 R **18 Claims**

1. Apparatus for winding strand material into a package, comprising:
a winding mandrel;
means for rotationally driving said winding mandrel;
means for guiding said strand material in the vicinity of said mandrel;
cam means for reciprocating said guide means parallel to the axis of said winding mandrel for forming a package build of said winding mandrel;
means for moving the strand guide means and said cam means away from said winding mandrel as the diameter of said package build increases;
said mandrel drive means including mandrel speed control means for progressively reducing the speed of rotation of said winding mandrel during the winding of said package to compensate for increases in the diameter of the package build; and

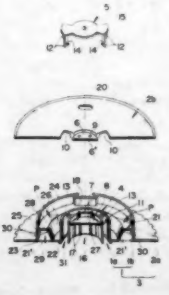


means for rotationally driving said cam means in synchronous relation to the decreasing speed of said winding mandrel whereby the speed of rotation of said cam means decreases in accordance with the mandrel speed reduction;
said cam drive means comprising means for increasing the rotational speed of said cam means a plurality of times during the winding of said strand material on said package build to counteract reduction of the helix angle at which the strand material is wound on the package build as the winding mandrel speed decreases.

4,371,123
TAPE REEL

Koji Watanabe, Fujisawa, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Feb. 27, 1981, Ser. No. 239,006
Claims priority, application Japan, Feb. 28, 1980, 55/24256[U]
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.8 **6 Claims**



1. In an injection-molded plastic tape reel comprising a hub

which includes an inner cylindrical part defining a socket for engagement with a playback-machine shaft, and an outer cylindrical part adapted to permit a tape to be wound into a roll thereon, and flanges attached one each to the opposite ends of said hub, said inner cylindrical part and said outer cylindrical part being connected to each other through means of an annular portion which includes a lower, radially inner horizontally disposed portion, an intermediate axially-upward, radially-outward inclined portion, and an upper, radially outer horizontally disposed portion, said annular portion defining an annular recess therebeneath, said radially inner horizontal portion being joined to the lower axial end of said inner cylindrical part while the radially outer horizontal portion is joined to said outer cylindrical part at a location approximately halfway upwardly along the axial extent thereof, the improvement comprising:

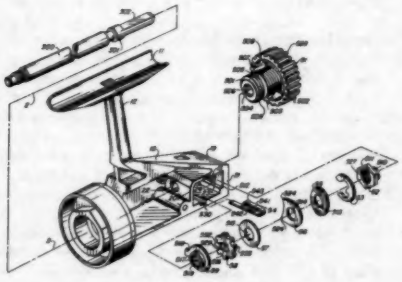
radially extending means, connected between said inclined portion of said annular portion upon the undersurface thereof and the inner wall surface of said outer cylindrical part so as to span said annular recess, for providing a plurality of auxiliary flow paths for the molten resin during said injection molding of said tape reel directly between said radially inner portion of said annular portion and one of said flanges which is integrally molded with the lower axial end of said hub, said auxiliary flow paths being substantially shorter than the normal flow paths over which said molten resin would otherwise travel between said radially inner portion of said annular portion and said one of said flanges.

4,371,124

DRAG SYSTEM FOR SPINNING STYLE FISHING REEL

Richard L. Gifford, Tulsa, and Richard R. Councilman, Collinsville, both of Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 18, 1979, Ser. No. 85,925
Int. Cl.³ A01K *89/01, 89/02*
U.S. Cl. 242—84.51 A **1 Claim**



1. In a spinning reel having a housing with a front spool end and a back drag end, a housing having an integral substantially right parallelepiped shaped pocket at the drag end with an inwardly positioned partition comprising one side of the parallelepiped having a first hole therein, an opposite surface of the parallelepiped at the back of the housing having a second hole in axial alignment with the first hole, a movable center shaft mounted in the housing in axial alignment with the first and second holes and having a front end extending outwardly from the front spool end of the housing and a back end having a key means extending into the pocket, a drag assembly mounted partially within the pocket comprising:

(a) thread means in operable association with the second hole;

(b) a knob having:

(1) a head mounted exterior to the housing,

(2) a shank having a distal end projecting in to the second hole and a proximal end secured to the head, the shank having a threaded portion in mating engagement with the thread means and a coaxial passageway for sliding fit with the back end of the shaft, and

(3) bearing means at the distal end of the shank facing axially of the shaft,

(c) disc spring means mounted in the pocket adjacent the bearing means and having a hole coaxial with the passageway,

(d) D-shaped means mounted in the pocket adjacent the spring means and having a hole coaxial with the passageway, the D-shaped means coacting with the pocket to prevent rotation of the D-shaped means while permitting axial movement of the D-shaped means;

(e) first washer means mounted in the pocket adjacent the D-shaped means and having a hole coaxial with the passageway;

(f) drive means mounted in the pocket adjacent the washer means and having a hole mating with the key means on the shaft, the drive means having a serrated exterior surface;

(g) second washer means mounted in the pocket between the drive means and the partition and having a hole coaxial with the passageway;

(h) the back end of the shaft extending into the passageway and rotatable therein, the shaft being freely rotatable when the knob is set to provide minimal urging force between the first washer means, the drive means and the second washer means, and rotation of the shaft being limited when the knob means is advanced into the pocket to place the spring means under compression and to force the spring means, the D-shaped means, the first and second washer means and the drive means tightly against the partition thereby limiting rotation of the drive means and concomitantly the shaft; and

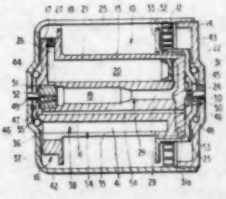
(i) a J-shaped spring means seated in an undercut groove in the pocket adjacent the drive means, the J-shaped spring means has a short leg in contact with the serrated exterior surface which vibrates making a clicking sound when the drive means rotates.

4,371,125

SAFETY BELT SYSTEM

Rudolf Andres, and Helmut Grantz, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz A.G., Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,799
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946130
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107 **31 Claims**



1. A windup means for a belt of a safety belt system for passenger motor vehicles for eliminating a slack in the belt upon a vehicle exceeding a predetermined deceleration, the windup means includes a belt roll-up mechanism comprising a shaft means, a retractor means constantly effectively acting upon the shaft means, a windup reel means connected to said shaft means, a pulley means adapted to be coupled with the shaft means at least upon a predetermined vehicle deceleration so as to eliminate the slack in the belt, and an ignitible propellant charge means for propelling a driving fluid so as to enable the windup means to eliminate the slack in the belt, characterized in that recess means are provided in an interior of the shaft

means for mounting the belt to the shaft means, the recess means include a longitudinally extending belt passage slot provided in the interior of the shaft means, a plurality of duct means filled with the driving fluid are arranged in the interior of the shaft means, the duct means terminate in openings at an end face of the shaft means, means are provided for communicating the duct means with the propellant charge means so as to enable the propellant charge means to act upon the driving fluid after an ignition of the propellant charge means, and in that means are provided for communicating the duct means with the pulley means whereby the driving fluid operates the pulley means to eliminate the slack in the belt upon ignition of the propellant charge means.

4,371,126

WEBBING LOCK DEVICE

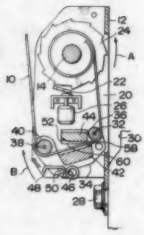
Hiroshi Tsuge, Chiryu; Takashi Kawaharazaki, Toyoake, and Jun Yasumatsu, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki-Kaisha Tokairika-Denki-Seisakusho, both of Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,814

Claims priority, application Japan, Oct. 4, 1979, 54-138276[U]

Int. Cl.³ A62B *35/08;* B65H *75/48*

U.S. Cl. 242—107.2 **10 Claims**



10. A webbing lock device for clamping and locking the intermediate portion of an occupant restraining webbing to positively restrain an occupant in an emergency of a vehicle, comprising:

(a) a frame solidly secured to the body of the vehicle;

(b) a takeup shaft journalled on said frame for winding thereon one end of the occupant restraining webbing by its biasing force, the other end of said webbing being connected to an occupant-restraining portion;

(c) acceleration detecting and operating means interposed between said takeup shaft and said frame for stopping the webbing wind-out rotation of the takeup shaft in an emergency of the vehicle;

(d) a stationary lock member solidly secured to said frame, one surface of which is formed into a first webbing clamping surface;

(e) a lock lever journalled on said frame and provided at a portion thereof with a movable lock member, one surface of said lock member being formed into a second webbing clamping surface;

(f) a guide member provided at the forward end of said lock member, on which the intermediate portion of the webbing between the takeup shaft and the occupant-restraining portion is wound, whereby, when a tension in the webbing is increased, the lock lever is rotated to cause the movable lock member to approach the stationary lock member; and

(g) a surface of curvature formed on either said first webbing clamping surface or said second webbing clamping surface for progressively increasing the clamping gap from the takeup shaft side to the occupant-fastening side during clamping the webbing, whereby a sharp change in tension in the clamped webbing is avoided so as to prevent the webbing from being ruptured, said clamping surfaces being formed to clamp the webbing along a portion of the length of the webbing.

4,371,127

SEAT BELT LOCKING DEVICE

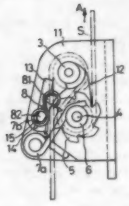
Toshiaki Shimogawa, Aichi; Takayuki Ando, Okazaki, and Satosi Kuwakado, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 27, 1981, Ser. No. 238,953

Claims priority, application Japan, Mar. 4, 1980, 55-27163

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.2 **7 Claims**



1. A seat belt locking device to be installed in a seat belt system of a vehicle together with an emergency lock retractor for locking a seat belt when a seat belt winding member of said emergency lock retractor is locked at an emergency time, comprising:

a first roller and a second roller along which said seat belt connected to said seat belt winding member of said emergency lock retractor is stretched;

said first roller being rotatably supported at a predetermined position by a fixed member of said vehicle;

said second roller being rotatably supported by said fixed member at a predetermined distance from said first roller in parallel therewith so as to be movable toward said first roller;

said seat belt being stretched through the space between said first roller and said second roller so that load is applied to said first roller and said second roller in the opposed directions to each other when said seat belt is tensioned;

a roller locking means which is provided between said fixed member and said second roller for locking said second roller when said second roller moves toward said first roller due to the load of said seat belt to strongly catch said seat belt between said first roller and said second roller at an emergency time; and

a load limiting means which is provided in said roller locking means for unlocking said locking means when load applied to said seat belt reaches a predetermined value to prevent said seat belt from being broken.

4,371,128

SEAT BELT RETRACTOR ASSEMBLY WITH PAWL MOUNTED PENDULUM

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corp., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 193,958

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **15 Claims**

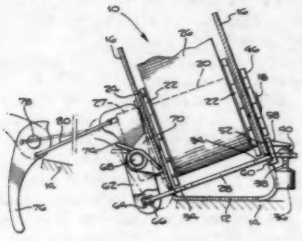
1. In an emergency locking seat belt retractor mechanism including a belt winding spool, at least one spool associated ratchet member having a plurality of ratchet teeth, locking pawl means mounted for engaging the ratchet teeth of said ratchet member on actuation thereof, and an improved emergency responsive means for automatically actuating said locking pawl means to lock said spool via said ratchet member comprising:

an inertia responsive mass mounted upon said locking pawl means;

said locking pawl means having one end thereof provided with one or more slots for forming an end tab;

said end tab having an aperture therein for mounting said inertia mass, and said end tab offset from said locking pawl means within said belt retractor mechanism parallel to the horizontal for mounting said inertia mass vertically thereto;

a second pawl slidably mounted upon said locking pawl means for automatic actuation by said inertia responsive mass in response to an emergency;



said second pawl configured to slide into said one or more slots within said locking pawl means for slidably mounting thereon;

a second ratchet member having a plurality of ratchet teeth mounted upon said spool which engages said second pawl when said second pawl is actuated by said inertia responsive mass; and

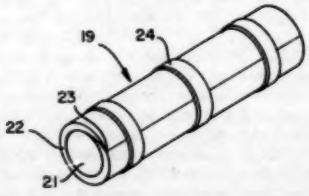
means on said second pawl to engage said first mentioned locking pawl means and draw said first locking pawl means into engagement with said first mentioned ratchet teeth thereby locking said spool.

4,371,129

BOBBIN FOR USE IN PRODUCING A MESOPHASE PITCH DERIVED CARBON YARN

David A. Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 17, 1980, Ser. No. 217,439
Int. Cl.³ B65H *75/12, 75/14*
U.S. Cl. 242—118.7 **5 Claims**



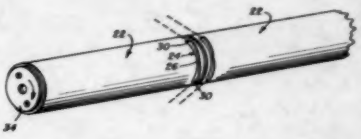
1. A bobbin capable of retaining thermoset yarn during a heat treatment to pyrolyze and carbonize the thermoset yarn to produce a good quality carbon yarn, comprising a cylindrical body made of a material selected from the group consisting of stainless steel, refractory compounds and alloys, and graphite; and a layer of compressible resilient carbon material positioned on the outside surface of said cylindrical body to receive said thermoset yarn and to minimize stress between said cylindrical body and said thermoset yarn during said heat treatment.

4,371,130

YARN TUBE WITH UNIVERSAL PICKUP GROOVE

Manson D. Case, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jan. 13, 1981, Ser. No. 224,674
Int. Cl.³ B65H *75/28*
U.S. Cl. 242—125.1 **7 Claims**



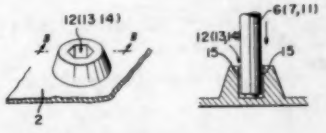
1. A yarn tube specifically adapted for rotation in opposed directions and yarn pickup in each opposed direction of rotation; said tube being elongated and having an outer yarn receiving surface, a pickup groove in said tube transverse to the length thereof and through said outer surface, said groove extending continuously about at least a substantial portion of the circumstance of the tube and having enlarged end sections, said groove further including a center section between and common to said end sections, said end sections each being of a greater width than said center section, the width of each groove end section increasing outward from the center section, thereby defining maximum width drop-in areas at the end sections of the groove in conjunction with a central narrow width gripping area for the gripping accommodation of the yarn moving inwardly, in either of the opposed directions of rotation, from either wide drop-in area to the narrow gripping area.

4,371,131

MAGNETIC TAPE CASSETTE

Masatohsi Okamura, and Kimio Tanaka, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,802
Claims priority, application Japan, Jan. 14, 1980, 55-3244
Int. Cl.³ G03B *1/04;* B23P *21/00*
U.S. Cl. 242—199 **1 Claim**



1. A magnetic tape cassette comprising:

a cassette casing defining at least one internal boss, each said boss having a recess defining recess walls;

a tape guide pole forcibly insertable into each said recess; and

means for releasing air during the forcible insertion of each said pole in each said recess, said means for releasing including a circular cross section for at least the portion of each said pole which is insertable in said recess, and a polygonal cross section for at least a portion of said walls of each said recess,

wherein the flat surfaces of said walls of each said polygonally shaped recess forcibly grip each said pole and the intersections of said flat surfaces permit air to escape.

4,371,132

REVERSIBLE THRUST DUCTED FAN PROPULSION UNIT

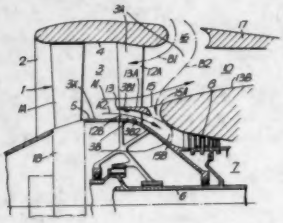
Clifford S. Woodward, Bristol, England, assignor to Rolls Royce Limited, London, England

Filed Jan. 12, 1981, Ser. No. 224,016

Claims priority, application United Kingdom, Jan. 11, 1980, 8000615

Int. Cl.³ F02K 3/06

U.S. Cl. 244—53 B **3 Claims**



1. A ducted fan propulsion unit for aircraft comprising an annular main duct, a fan contained within the main duct and having blades the pitch of which is reversible, a first opening defined in the duct forward of the fan, an annular flow splitter situated rearward of the fan and dividing the main duct into radially outer and inner branch ducts, a passage extending radially through the splitter to connect the branch ducts, outer stator vanes provided in the outer branch duct forward of said passage, inner stator vanes provided in the inner branch duct forward of said passage, a second opening defined in the outer branch duct rearward of the stator vanes therein, wherein the part of the inner branch duct lying forward of the passage is defined by radially outer and inner surfaces configured so there is a progressively rearwardly reducing diameter of said inner duct, and wherein the part of the inner duct rearward of said passage is defined by outer and inner surfaces configured so there is a progressively rearwardly reducing diameter and leading to a compressor of a gas turbine engine for driving the fan, said radially outer surface of said inner duct forward of said passage being shaped so as to urge the air flow in said inner duct in a radially inward direction.

4,371,133

DUCTED PROPELLER AIRCRAFT

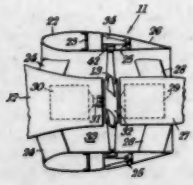
John K. Edgley, Elsworth, England, assignor to Edgley Aircraft Limited, Cambridgeshire, England

Filed Apr. 30, 1980, Ser. No. 145,341

Claims priority, application United Kingdom, May 1, 1979, 7915156

Int. Cl.³ B64D 27/02; B64C 3/32

U.S. Cl. 244—54 **16 Claims**



1. An aircraft having lift-producing means comprising a mainplane, a prime mover, a propeller with a hub operatively driven by the prime mover in use to produce by movement through the ambient air sufficient thrust for flight of the aircraft, the propeller being located intermediate the port and starboard ends of the mainplane, and an annular shroud including a mainplane support portion, the shroud comprising:

(i) a duct surrounding the propeller defining an upstream end so located relative to the lift producing means that it is unimpinged or substantially upimpinged upon by any portion of the turbulent airflow emanating from the lift producing means;

(ii) said mainplane support portion of said shroud being the or a primary load path along which torsional and bending stresses to which the mainplane is subject in use are passed between the portion of the mainplane to the port side of the shroud and the portion of the mainplane to the starboard side of the shroud;

(iii) said shroud including a trailing portion within which the propeller rotates;

(iv) said propeller being mounted to the prime mover, and the prime mover being fixedly mounted to the trailing portion of the shroud, so that the propeller is held substantially fixed against transverse movement relative to the longitudinal axis of the trailing portion of the shroud; and

(v) said trailing portion of the shroud being mounted to the mainplane support portion of the shroud by resilient mounting blocks which serve to isolate vibrations of the prime mover in directions transverse to the longitudinal axis of the aircraft in the trailing portion from the mainplane support portion of the shroud.

4,371,134

ARTIFICIAL SATELLITE ARRANGEMENT WITH UNFOLDABLE SOLAR GENERATORS AND ANTENNAS

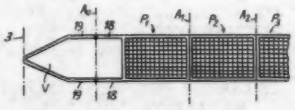
Georges Marello, and Jean-Claude Vermalle, both of Mandelieu, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 18, 1980, Ser. No. 217,662

Claims priority, application France, Jan. 4, 1980, 80 00109

Int. Cl.³ B64G 1/30

U.S. Cl. 244—173 **4 Claims**



1. In an artificial satellite arrangement comprising a satellite body, at least one solar generator comprising an assembly of panels bearing solar cells and articulated on one another in succession to occupy either a folded position in which said panels are folded on one another in zig-zag form, or an unfolded position in which said panels are at least substantially in line with one another and project outwardly from said body, a flap having one end articulated to said body and the other end articulated to a proximal panel in said assembly of panels, and at least one antenna articulated on said body to occupy either an unfolded position in which said antenna is located laterally away from said body or a folded position in which said antenna is located directly above said body and said assembly of panels, when said assembly is folded,

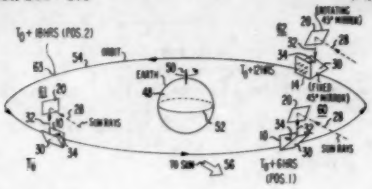
the improvement comprising:

lateral extensions rigidly affixed to and projecting from each of said flap and said proximal panel and articulation means interconnecting the free ends of said extensions, said extensions projecting toward said folded antenna when said assembly of panels is folded, said extensions being laterally spaced by a distance sufficient to clear said folded antenna.

4,371,135
SOLAR ARRAY SPACECRAFT REFLECTOR

John E. Keigler, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 61,866, Jul. 30, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,576
Int. Cl.³ B64G 1/00, 1/44
U.S. Cl. 244—173 8 Claims



8. A solar converter system for use in a satellite in space in synchronous orbit about a rotating planet such that one surface of a satellite continuously faces the planet, comprising in combination:

a panel member mounted to said one surface of said satellite and including energy converter means having solar cells on a first flat surface and an antenna array on the opposite surface, where said opposite surface and said antenna array continuously face said planet;

a first mirror in fixed relation to the member, having a reflecting surface facing the first surface and being at an acute fixed angle thereto;

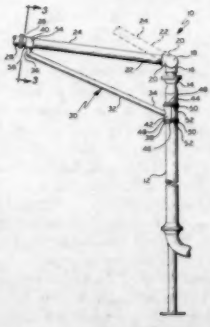
a second mirror, this one rotatable about an axis such that the reflecting surface of the second mirror always faces the reflecting surface of first mirror regardless of the position of the second mirror on its axis; and

means for rotating the second mirror about its axis and relative to said first mirror as the satellite orbits the planet, in such a way that the reflecting surface of the second mirror continuously faces the sun and directs the sun's rays onto the reflecting surface of the first mirror, the latter reflecting these rays onto the first surface of the first member.

4,371,136
PRODUCT LOADING ARM STORAGE KEEPER

Roger D. Clay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1980, Ser. No. 209,927
Int. Cl.³ F16L 3/00
U.S. Cl. 248—49 9 Claims



1. A loading arm keeper for use with a loading arm assembly including first and second tubular portions connected by a tubular swivel, comprising:

a rigid arm having first and second end portions;

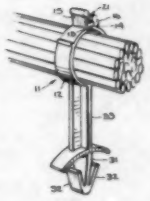
clamp means on the first end portion of said rigid arm for securing the first end portion of said rigid arm to said first tubular portion of said loading arm assembly; and

loading arm retainer means on the second end portion of said rigid arm for selectively engaging said second tubular portion of said loading arm assembly so as to restrict movement of said second tubular portion of said loading arm assembly relative to said first tubular portion of said loading arm assembly via said tubular swivel, said loading arm retainer means comprising a generally U-shaped saddle member fixedly secured to the second end portion of said rigid arm and sized and shaped to generally conform to the outer surface of said second tubular portions of said loading arm assembly.

4,371,137
WIRE BUNDLE CLAMP

Bernard Anscher, 21 Elm St., Woodbury, N.Y. 11797

Filed Mar. 26, 1981, Ser. No. 247,838
Int. Cl.³ F16L 3/08
U.S. Cl. 248—73 11 Claims



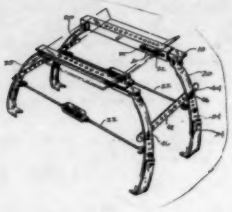
1. A wire bundle clamp comprising: a flexible band and a snap-locking means, the complementary component members of which are disposed on the ends of said flexible band; said flexible band having a natural curvature defining a band enclosure and serving to place the complementary component members of said snap-locking means in a juxtaposed alignment which defines therebetween an annular opening for the insertion of axially aligned workpieces, whereby a pinching action imposed on the ends of said flexible band in the proximate area of the complementary component members of said snap-locking means will drive said snap-locking means members along arcuate paths adapted to bring them into touching engagement and locking alignment from which position the application of a sufficient pinching force to overcome the natural resistance of said snap-locking means will drive the complementary component members of the snap-locking means into locking engagement; said flexible band having finger-grip tabs, each said tab extending from the outwardly disposed surface of said flexible band in the proximate location of the snap-locking means component members, whereby a pinching action may be conveniently and easily imposed on said finger-grip tabs, thereby serving to captively drive the complementary component members of said snap-locking means into snap-locking engagement, said finger-grip tabs being aligned and adapted to permit the easy opening of said wire bundle clamp from its locked position by the insertion, between said finger-grip tabs, of an object, sized and configured to exceed at a point along its inserted length, as orientated during insertion or as reorientated subsequent to insertion, the natural separation of said finger-grip tabs on the locked wire bundle clamp, whereby the insertion or reorientation after insertion of said object will impart through said finger-grip tabs a disengaging force upon said snap-locking means, which force will overcome the natural resistance of said snap-locking means causing it to snappingly unlock.

4,371,138

DEVICE FOR MOUNTING EQUIPMENT IN VEHICLES

Herbert B. Roberts, 219 Glen Cove Dr., Chesterfield, Mo. 63017

Filed Dec. 3, 1979, Ser. No. 99,493
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—201 **3 Claims**



1. A device suitable for mounting equipment such as citizen band transceivers, stero components and the like about the transmission housing hump in the front portion of rear drive vehicles comprised of:

(1) at least two horizontal transverse mounting brackets comprised of over-lapping right angle structures with matching openings therein,

(2) legs mounted on opposite ends of said transverse mounting brackets and in hinged relation therewith,

(3) means for tightening said legs into abutting relationship with said transmission housing hump, and,

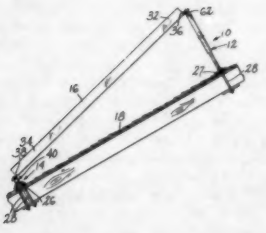
(4) means for mounting said portable equipment on said transverse mounting brackets.

4,371,139

ADJUSTABLE MOUNTING RACK FOR SOLAR COLLECTORS

Peter D. Clark, East Berlin, Conn., assignor to Sunsearch, Inc., Guilford, Conn.

Filed Dec. 31, 1979, Ser. No. 108,942
Int. Cl.³ A47G *29/02*; E04G *3/08*; E06G *7/28*
U.S. Cl. 248—237 **10 Claims**



1. In combination with a solar collector and a support surface therefor, a rack for mounting the collector at an angle to the horizontal to receive solar radiation, said rack comprising first and second independent support assemblies,

said first support assembly having a first pair of spaced apart leg members with a first support member extending between the upper ends thereof, said leg members having flange members rigidly connected on the lower ends thereof for attaching said leg members to the support surface essentially perpendicular thereto and in fixed relation therewith, said leg members including means for varying the length thereof,

said second support assembly comprising a second pair of spaced apart leg members with second elongated support member extending therebetween, flange members rigidly connected on the lower ends of said second leg members for attaching said second legs to the support surface essentially perpendicular to the support surface and in fixed relation therewith,

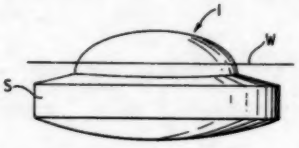
said first and second support assemblies, being spaced apart with said support members in essentially parallel relationship, and means secured to said collector adjacent opposite ends thereof and rotatably connected to each of said support members.

4,371,140

BUOYANT SOAP HOLDER

Nikalous von Obstfelder, 9 Langton Rd., Tunbridge Wells, Kent, England

Filed Jan. 2, 1981, Ser. No. 222,211
Int. Cl.³ A47B *91/00*
U.S. Cl. 248—359 **4 Claims**



1. A buoyant support for a bar of soap, comprising a generally dome shaped upper wall member having an internal projecting spigot, a separate lower wall member having an internal projecting lower wall spigot and being engaged with said upper wall member with said spigot interfitting with said lower wall spigot and defining an air chamber between said upper wall member and said lower wall member with sufficient volume to render buoyant a bar of soap, said lower wall member being shaped to conform to the surface of the bar of soap and having teeth-like formations projecting from said lower wall member engageable into the bar of soap, said lower wall member including an integral hollow projection capable of being embedded in the soap, said teeth-like formations being arranged in a row adjacent the edge of said lower wall member and encircling said hollow projection, said upper wall member being shaped to represent an object, said upper wall member having a peripheral wall, and a box having a peripheral wall adapted to support and interlock with said peripheral wall of said upper wall portion and to accommodate a bar of soap.

4,371,141

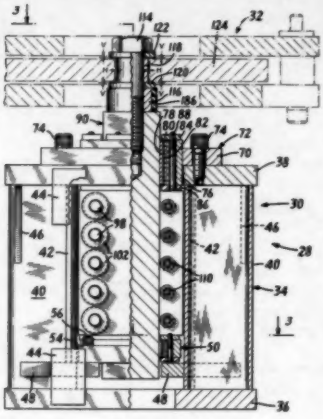
VIBRATION ISOLATION SYSTEM WITH ADJUSTABLE CONSTANT FORCE, ALL-DIRECTIONAL, ATTENUATING SEISMIC RESTRAINT

Paul Barstoff, Jackson Heights, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,241
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—569 **11 Claims**

1. A vibration isolation system for mounting a unit on a support including a plurality of vibration isolators interposed between the unit and the support and at least one seismic restraint assembly interposed between the unit and the support characterized in that the seismic restraint assembly includes a vertical frame attached to one of the unit and the support, vertical guide bearings on the vertical frame, a vertical damper element received to move vertically in the vertical guide bearings, at least one vertical friction element carried by the vertical frame, at least one resilient device holding the friction element in engagement with the vertical damper element to generate a predetermined vertical frictional restraining force acting therebetween that is substantially less than the maximum vertical input force of a seismic event, a horizontal damper element coupled to the vertical damper element for vertical and horizontal movements relative thereto corre-

sponding to selected normally expected movements of the unit, relative to the support, on the isolators but engageable with the vertical damper element upon greater than the selected movements, a horizontal frame connected to the other of the unit and the support, horizontal guide bearings on the horizontal frame guiding the horizontal damper element for horizontal movement relative thereto at least one horizontal friction element carried by the horizontal frame, at least one other resilient device holding the horizontal friction element in en-



gagement with the horizontal damper element to generate predetermined horizontal frictional restraining forces acting therebetween that are substantially less than the maximum horizontal input force of a seismic event, and vertical and horizontal stops for limiting the total relative displacement of the unit, resulting from a seismic event, whereby the friction elements limit the vertical and horizontal forces transmitted from the support to the unit to values substantially less than the maximum input forces.

4,371,142

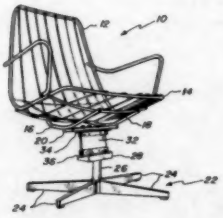
ROCKING CHAIR

Donald L. Bottemiller, and John K. Miles, both of Wadena, Minn., assignors to Homecrest Industries Incorporated, Wadena, Minn.

Continuation-in-part of Ser. No. 907,810, May 19, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,824

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—573 **8 Claims**



1. A rocking chair comprising:

a chair base;

a chair;

flexible plastic sheet means connected between the chair base and the chair for supporting the chair and its occupant and permitting rocking of the chair with respect to the base in a plane essentially normal to a major surface of the flexible sheet means by flexing of the flexible plastic sheet means;

first mounting means for connecting one end of the flexible sheet means to the chair base;

second mounting means for connecting an opposite end of the flexible sheet means to the chair, the flexible sheet means extending generally upwardly from the first mounting means to the second mounting means at a slight inclination rearwardly from a vertical position so that the chair and its occupant apply a primarily compressive load to the flexible plastic sheet means, and

stop means comprising cooperating elements on said first and second mounting means, at least one of said elements extending towards the other, said elements normally being spaced but engaging each other when said chair is rocking rearwardly to stop further flexure of the flexible sheet means and thus to prevent the chair and its occupant from achieving a position which would cause tipping of the chair base rearwardly.

4,371,143

EARTHQUAKE ISOLATION FLOOR

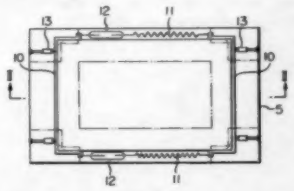
Jiro Ishida, Kamagaya, Japan, and Tak.fumi Fujita, 1-8-2-207, Saiwai-cho, City of Chiba, Chiba Prefecture, Japan, assignors to Mitsubishi Steel Mfg. Co., Ltd., Tokyo and Takafumi Fujita, Chiba, both of, Japan

Filed Oct. 23, 1980, Ser. No. 199,981

Claims priority, application Japan, May 24, 1980, 55-69196; Jun. 5, 1980, 55-74984

Int. Cl.³ F16M *1/00*

U.S. Cl. 248—638 **26 Claims**



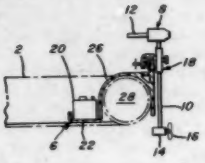
1. An earthquake isolation floor comprising a stationary horizontal fundamental frame having a substantially polygon configuration in plane view, a movable horizontal support frame having a similar configuration to that of said fundamental frame, but smaller in dimensions than that of said fundamental frame, and slidably mounted thereon, said support frame has a substantially rectangular configuration in plane view, horizontal tensile springs disposed between said fundamental and support frames each in a prestressed condition such that when said support frame is moved relative to said fundamental due to the onset of an earthquake, said springs are caused to be elongated by the fact that one end of said springs does not encounter any resistance to the movement thereof, while the other end opposite to the movement is prevented from moving, a pair of spring-mounting brackets being respectively arranged along one pair of the confronting sides of said support frame on said fundamental frame so as to have each end of said bracket somewhat projected beyond said sides, whereby the confronting ends of said spring-mounting bracket are connected together by said horizontal tensile springs respectively disposed along the other pair of the confronting sides of said support frame, and stopping means are provided on said fundamental frame as the normal position of said support frame such that, when said support frame is moved in the direction of said horizontal tensile springs, one of said spring-mounting brackets arranged in said direction can be moved in accompaniment with said support frame, while the other of said spring-mounting brackets arranged opposite to said direction is prevented from moving by said stopping means.

4,371,144

MOTOR SECURING DEVICE FOR WATERCRAFT

Harry H. Godlewski, 5454 California Ave., Bethel Park, Pa. 15102

Filed Apr. 10, 1981, Ser. No. 252,956
Int. Cl.³ B63B 7/08
U.S. Cl. 248—641 15 Claims



1. A motor securing device for watercraft comprising

generally downwardly open securing means for securing said device to said watercraft,

motor attachment means projecting generally upwardly from a rear portion of said securing means,

said securing means having a channel for receipt of a portion of said watercraft,

a battery securing shelf connected to and extending forwardly from said securing means, whereby a motor secured to said motor attachment means and a battery disposed on said shelf will provide a counterbalancing action and,

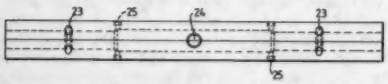
retainer means for resisting undesired displacement of a battery disposed on said shelf.

4,371,145

INJECTION MOLD FOR COAXIAL CABLE JOINTING

Stuart R. Barnes, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,464
Claims priority, application United Kingdom, Oct. 14, 1980, 8033084
Int. Cl.³ B29C 6/00; B29F 1/00
U.S. Cl. 249—80 6 Claims



1. An injection mold for coaxial cable joints comprising:

an outer elongate mold portion having a longitudinal split,

an inner elongate mold portion disposed in said outer portion and having a higher coefficient of thermal expansion than said outer portion, said inner portion having a longitudinal split,

said outer portion having a longitudinal split and locking means for assembly around said inner portion,

heating and cooling channels located in said outer portion, and

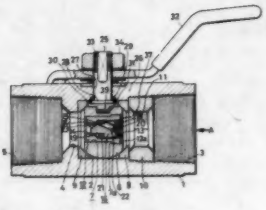
cooperating filler holes disposed in said inner and outer portions.

4,371,146

BALL VALVE

Hisayoshi Mese, Taishibashi, and Shigeo Kanaya, Suita, both of Japan, assignors to Fuji Metal Mfg. Co., Ltd., Osaka, Japan

Filed Mar. 25, 1981, Ser. No. 247,396
Claims priority, application Japan, Mar. 25, 1980, 55-38497
Int. Cl.³ F16K 5/10, 47/04
U.S. Cl. 251—209 5 Claims



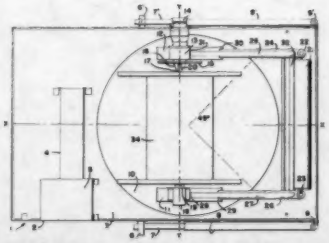
1. A ball valve, comprising a valve case forming an internal space that is centrally extending to opposite inlet and outlet sides, a ball valve element disposed within the interior space and having a bore extending therethrough, a valve seat rotatably supporting the ball valve element, a valve stem fixed to one side of the ball valve element and having an operating lever at one end of the valve stem projecting therefrom outside the valve case, and a flow adjusting internal valve assembly means provided in the bore, comprising an internal cylindrical valve casing in the bore and having an internal valve seat portion, and an axially movable internal valve element disposed within the internal cylindrical valve casing, wherein the internal cylindrical valve casing comprises an internally threaded large-diameter portion at its inlet side, a small-diameter guide bore portion at its outlet side and an intermediate portion positioned therebetween and having a tapered inner surface providing the internal valve seat portion, and the internal valve element comprises an externally threaded head screwed in the internally threaded portion and a cylindrical leg extending from one end of the head toward the outlet side and inserted into the guide bore portion, the head being formed with a slanting fluid channel, the leg having a slanting surface opposed to the internal valve seat portion.

4,371,147

VEHICLE MOUNTABLE CABLE REEL APPARATUS

Lance D. Ridgway, Carlsbad, N. Mex., assignor to Hy-Reel Machinery, Inc., Carlsbad, N. Mex.

Filed Mar. 26, 1980, Ser. No. 134,236
Int. Cl.³ B66D 1/38, 3/02
U.S. Cl. 254—326 27 Claims



5. A vehicle mountable hydraulic cable reel apparatus comprising:

a cable reel bed comprising bed frame members;

a turntable mounted on the bed frame members;
a turntable operating motor mounted on the bed, and means connecting said motor to the turntable to turn the turntable;
first and second vertical stanchions mounted on said turntable;
a tail stock assembly, and means connecting said tail stock assembly to said first vertical stanchion;
a shaft bearing assembly, and means connecting said bearing assembly to the second vertical stanchion;
a reel motor, and means connecting said reel motor to the shaft bearing assembly, whereby a cable reel supported between the tail stock assembly and the bearing assembly may be driven by the reel motor;
a horizontal cable roller with vertical guide rollers disposed at a first end and second end of said horizontal cable roller with parallel truss means connecting said horizontal cable roller to said first and second vertical stanchions;
and pivot means connected to the frame members, outrigger means connected to the pivot means and means for locking the outrigger means at an angle to the frame members, cable guiding means connected to a distal end of the outrigger means for guiding a cable passing through the guiding means from the cable reel via the cable roller.

4,371,148

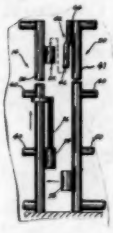
PIVOTAL CONNECTION FOR ENCLOSURE SECTIONS

Richard L. Harden, R.R. 1, Lineville, Iowa 50147

Division of Ser. No. 118,912, Feb. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 845,872, Oct. 27, 1977, Pat. No. 4,193,378, which is a continuation of Ser. No. 709,862, Jul. 29, 1976, Pat. No. 4,089,301. This application Dec. 15, 1980, Ser. No. 216,205

Int. Cl.³ E04H *17/16*

U.S. Cl. 256—26 **2 Claims**



1. An enclosure comprising,
a plurality of pivotally interconnected, detachable sections,
a pair of vertically spaced apart hinges interconnecting adjacent sections,
one of said hinges including a rigid vertically nonmovable downwardly extending pin secured at its upper end to one of said sections and having a lower free end, and a vertically disposed sleeve on the adjacent section to receive the free end of said pin;
the other of said hinges including vertically disposed and aligned sleeves with the sleeve on one section being below the sleeve on the other section, and a vertically movable pin received in both of said aligned sleeves; and
said sleeves of said other hinge functioning as cooperating stop means to limit relative vertical movement when in a common vertical plane with said sections interconnected and to allow relative vertical movement when said sections are displaced laterally relative to each other, whereby said one section having said downwardly extending pin may be raised relative to said other section to allow said downwardly extending pin to enter said sleeve of said one hinge and then be lowered and moved into vertical alignment with said other section such that said movable pin of said other hinge may be lowered through said sleeve on said other section and into said sleeve on said one section to complete the pivotal locking engagement between adjacent sections.

4,371,149

APPARATUS FOR COOLING SHEET STEEL BY WATER SPRAYING

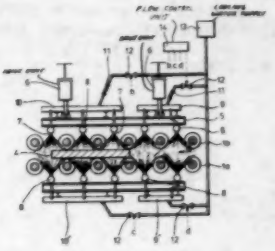
Osamu Takeuchi, Mitaka; Haruo Kokubun, Yokosuka; Hisashi Yoshizaga, Osaka; Shuichi Hara, Izumisano, and Hironichi Ban, Osaka, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Jul. 21, 1980, Ser. No. 169,508

Claims priority, application Japan, Nov. 9, 1979, 54-145098

Int. Cl.³ C21D *11/00*

U.S. Cl. 266—90 **6 Claims**



1. An apparatus for cooling sheet steel by water spraying comprising
(a) a lower wheel conveyor section,
(b) an upper wheel conveyor section dispoed above said lower wheel conveyor section in symmetrical relationship therewith so as to define a path of travel therebetween of a sheet of steel to be cooled,
(c) a reversible drive unit drivingly coupled to said lower wheel conveyor section so that said sheet of steel placed thereon may be reciprocated lengthwise,
(d) lower and upper water spraying systems disposed immediately below and above said lower and upper wheel conveyor sections, respectively, each of said lower and upper water spraying systems including an array of water spray nozzles directed toward said sheet of steel,
(e) each of said water spray nozzles being constructed whereby the cooling water fed into the inlet of the spray nozzle is divided into two flows or jets having different vectors, and said two flows or jets strike against each other just within the orifice of the spray nozzle, whereby the cooling water may be atomized or broken up into extremely fine droplets only under the pressure of the cooling water,
(f) each of said spray nozzles being provided with spray-direction control means which causes the associated spray nozzle to change the spray direction or the axis of said associated spray nozzle through a predetermined angle range in a plane widthwise and perpendicular to said sheet of steel on said lower wheel conveyor section in response to deformations of said sheet of steel,
(g) a vertical drive unit for moving said upper wheel conveyor section up and down in unison with said upper water spraying system,
(h) a cooling water supply system for supplying the cooling water under pressure to said array of spray nozzles in each of said lower and upper water spraying systems, the spray nozzles in each of said lower and upper water spraying systems being divided into at least two groups in the lengthwise direction of said apparatus, and

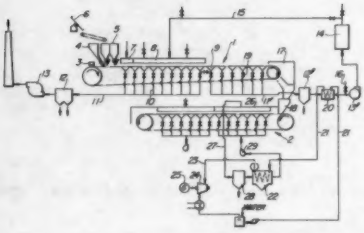
(i) flow control means for supplying cooling water to each of said groups of spray nozzles.

4,371,150

SINTERING PLANT

Toshio Tsukuda, Niihama, Japan, assignor to Sumitomo Heavy Industries, Inc., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,717
Claims priority, application Japan, Nov. 2, 1979, 54-141192
Int. Cl.³ F27B 9/12
U.S. Cl. 266—155 3 Claims



1. A sintering plant in combination with an energy recovery system wherein the sintering plant comprises:

a sintering machine having transport means for continuously transporting raw materials, and means for igniting the raw materials being transported, whereby the raw materials are sintered while being transported to a discharge end of the machine.

means for feeding quicklime to a lower layer of the raw materials fed on the transport means;

an array of wind boxes disposed below the transport means for sucking gases generated when the raw materials are sintered;

desulfurization means;

a first duct connected to an upstream half of the wind box array for discharging gases therefrom;

a second duct connected between a downstream half of the wind box array and the desulfurization means; and

means for removing heat from the finished sinter discharged from the sintering machine including a high temperature section and a low temperature section downstream thereof; and

the energy recovery system comprises;

a steam-producing boiler operatively associated with said means for removing heat, said boiler receiving heat therefrom;

heat exchanger means disposed in said second duct and connected to said boiler for preheating water fed to said boiler;

means for circulating cooling gases from said high temperature section to said boiler and back to said high temperature section;

means for utilizing steam produced in said boiler;

conduit means interconnecting a source of water, said heat exchanger means, said boiler and said utilizing means; and

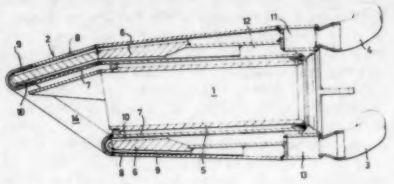
means for circulating water in said conduit means.

4,371,151

BLAST FURNACE SMELTING OF ZINC

Michael W. Gammon, Bristol, and John A. Clarke, Thornbury; both of England, assignors to Metallurgical Process Limited and I.S.C. Smelting Limited, both of Nassau, The Bahamas

Filed Aug. 1, 1978, Ser. No. 929,977
Claims priority, application United Kingdom, Sep. 15, 1977, 38512/77
Int. Cl.³ F27B 1/16
U.S. Cl. 266—186 8 Claims



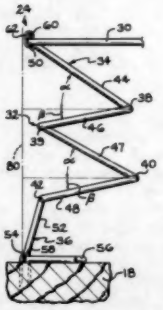
1. A tuyere for a blast furnace, the tuyere comprising a main body in the form of a tube with a central bore of substantially constant cross-section, and a nose portion having a hood-like extension of the upper wall only of the tube, said extension being downwardly inclined with respect to the longitudinal axis of said main body when the tuyere is installed in a furnace, whereby gas passing through the nose of the tuyere is deflected downwardly by said extension, which extension has a gas outlet aperture of greater area than said constant cross-sectional area of the bore of the tube.

4,371,152

BOX SPRING ASSEMBLY WITH IMPROVED SPRING INSTALLATION CAPABILITY

John P. Kitchen, Georgetown, Ky., and Jack C. Mandusky, Adrian, Mich., assignors to Hoover Universal, Inc., Saline, Mich.

Filed Jan. 25, 1980, Ser. No. 115,296
Int. Cl.³ A47C 25/00, 23/04; F16F 3/00, 1/14
U.S. Cl. 267—103 5 Claims



1. In a box spring assembly which includes a generally rectangular frame, a plurality of vertically deflectable wire springs mounted on said frame and connected to each other so as to yieldably resist downwardly directed bedding loads, each of said springs being formed of spring steel wire and having a generally horizontal body portion arranged above said frame and downwardly extending end portions, each of said end portions having an upper section and a lower section, said upper section comprising a plurality of substantially horizontal torsion bars and a plurality of angularly arranged connecting bars connected to and extending between said torsion bars, some of said torsion bars constituting inner torsion bars and

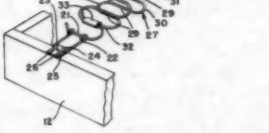
others of said torsion bars constituting outer torsion bars, said inner torsion bars in each end portion being located in closer proximity to the other end portion of said spring than said outer torsion bars, said torsion bars being movable in response to torsional stressing thereof to enable downward yieldable collapsing deflection of said end portion, said lower section comprising a generally upright, upwardly and inwardly inclined column of wire, said column of wire terminating at the lower end thereof in a frame engaging torsion bar which constitutes an outer torsion bar and is spaced from the other end portion of said spring a distance at least as great as all of the other outer torsion bars in said one end portion, and connecting means securing said frame engaging torsion bar to said frame, said column of wire terminating at the upper end thereof at the lowermost of said outer torsion bars other than said frame engaging torsion bar, that connecting bar which connects such lowermost torsion bar to the immediately succeeding and lowermost, inner torsion bar being disposed at an inclination in the same upward and inward sense as said column of wire but more horizontal than said column of wire.

4,371,153

SINUOUS SPRING WITH DEPTH CONTROL

Daniel Krakauer, Great Neck, N.Y., assignor to Kay Springs, Inc., Syosset, N.Y.

Filed Oct. 2, 1980, Ser. No. 192,947
Int. Cl.³ F16F *3/02*
U.S. Cl. 267—105 **10 Claims**



1. A sinuous spring structure for furniture seating frames having spaced-apart front and rear rails comprising a prestressed sinuous wire spring having linear cross-bars connected by semicircular loops, said prestressed sinuous spring having terminal cross-bar ends, one of said terminal cross-bar ends being connected to said front rail and the other terminal cross-bar end being connected to said rear rail with the sinuous spring having a mid-span with an upwardly arching free span between said rails in the spring unloaded condition, an auxiliary downwardly contoured prestressed sinuous reinforcing member connected to spaced selected cross-bars of said sinuous spring and eccentrically spaced from either terminal cross-bar and beneath said sinuous spring controlling the elongation and bending of the sinuous spring connected to said auxiliary reinforcing member under a loaded condition and sinuous spring deflection whereby increased depth of seating without objectionable bucketing occurs as modified by said auxiliary reinforcing member relative to an unreinforced sinuous wire spring.

4,371,154

SPRING ASSEMBLY AND METHOD FOR MANUFACTURE THEREOF

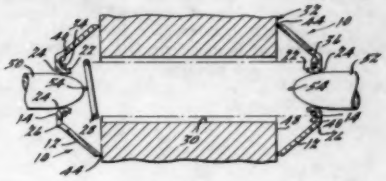
Paul H. Winbigler, Coldwater, Mich., assignor to Kuhlman Corporation, Troy, Mich.

Filed Dec. 31, 1981, Ser. No. 221,710
Int. Cl.³ F16F *1/12*; B21F *35/00*; B23P *13/00, 11/00*
U.S. Cl. 267—179 **10 Claims**

1. A method of attaching an expander cap to a helical coil spring comprising:

placing an expander cap on one end of a helical coil spring, said expander cap having a central opening defined by a plurality of tab portions spaced around the periphery thereof, said opening being positioned coaxially with the axis of said spring;

moving punch means through said opening from the side of said expander cap opposite said spring into said one end of said spring so as to deform said tab portions over the end coil of said spring, said punch means having a diameter larger than said central opening.



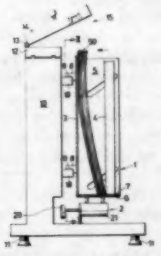
10. A spring expander cap assembly comprising a helical coil spring having end coils provided on opposite ends thereof, a pair of expander caps, each of said expander caps including a hollow generally frusto conically shaped skirt portion and a central opening therethrough, said opening being defined by a plurality of axially inwardly extending tab portions having slits therebetween, one of said expander caps being secured to each of said end coils by deforming said tab portions through the action of punch means being moved through said opening so as to cause each of said tab portions to fold over respective of said end coils.

4,371,155

APPARATUS FOR JOGGING A SHEAF OF PAPERS

Ulf J. E. Asterö, Tumba; Johan A. F. Dahlberg, Stockholm, and Kjell U. Aberg, Södertälje, all of Sweden, assignors to Aktiebolagen HB Astero & Stockhaus, Sweden

Filed Sep. 16, 1980, Ser. No. 187,724
Claims priority, application Sweden, Oct. 25, 1979, 7908860
Int. Cl.³ B42C *1/12*; B65H *31/40*
U.S. Cl. 270—53 **10 Claims**



1. Apparatus for jogging a sheaf of papers for evening the edges of the sheaf, comprising:

a sheaf compartment including two substantially vertically oriented side walls, at least one end wall substantially vertically oriented and at right angles to the side walls and a bottom wall at right angles to said at least one end wall, wherein said compartment is adapted for carrying the sheaf with its edges lying substantially in the vertical plane, and wherein a high friction material covers the bottom wall of the compartment;

spring means for resiliently supporting said sheaf compartment; and

vibration means secured to said compartment for vibrating

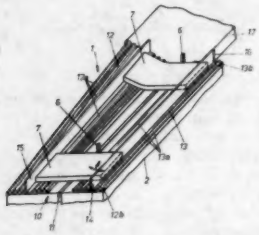
the compartment, said vibration means giving the compartment a vertical vibration component as well as a horizontal vibration component which latter intersects the side wall plane of the compartment at an oblique angle.

4,371,156

CENTERING CONVEYOR, PARTICULARLY FOR BOOKBINDERY AND THE LIKE

Giorgio Pessina, and Aldo Perobelli, both of Via Arborina 2, Paderno Dugnano, (Milano), Italy (20037)

Filed Oct. 17, 1980, Ser. No. 197,791
Claims priority, application Italy, Oct. 17, 1979, 26556 A/79
Int. Cl.³ B65H *39/055*
U.S. Cl. 270—54 6 Claims



1. In a bookbinding machine, an intermediate centering conveyor (1) between a collator and a stacker, said intermediate conveyor engaging books which it moves from the collator to the stacker and constituting:

(A) a supporting frame (2),

(B) a chain (3) with entraining means (6) and driving means (4,5) for transferring books in mutually spaced relationship from the collator to the stacker, and

(C) a work surface (10) divided by a slit (11) for the passage of the entrainers therethrough into two stationary halfsurfaces (12,13),

the improvement comprising:

(D) one of said surface halves (13) extending substantially along a horizontal plane,

(E) the other of said surface halves (12) being an elongated continuous surface having a portion inclined relative to said horizontal plane at an input end of the intermediate conveyor and a substantially horizontal surface at the output end of the intermediate conveyor, which hozizontal surface is substantially coplanar with the one surface half (13), a transition portion being continuous with and interconnecting said inclined portion with said horizontal portion, said transition portion providing a surface for gradually and continuously transitioning books conveyed along said surface halves from a partially inclined orientation to a fully planar horizontal position,

(F) stationary friction attenuating means (12*a*, 13*a*) forming the upper surfaces of the two surface halves,

(G) different elongated side boards (14,15) mounted on each of said surface halves on opposite sides of the slit, for aligning the sheets of the books as the books are conveyed along the surface halves,

(H) one of said side boards (14) being located on the horizontal surface half (13) extending in a substantially horizontal direction parallel to the horizontal plane of said horizontal surface half,

(I) means connecting the end of the side board (14) at the input end of the intermediate conveyor for swinging movement about a vertical axis, and

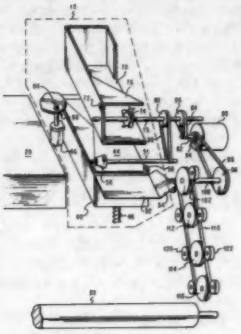
(J) screw clamps for detachably securing said side boards to their associated halves.

4,371,157

COMPACT ENVELOPE HANDLING DEVICE

Ronald E. Hunt, Georgetown, and William M. Jenkins, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,684
Int. Cl.³ B65H *5/00*
U.S. Cl. 271—2 7 Claims



1. Envelope handling apparatus for feeding to and delivering from an operating station comprising:

first hopper means for holding a stack of envelopes in an orientation transverse to that of said operating station;

means for separating the topmost envelope in the stack;

first means for pivoting the separated envelope 90° comprising a first restraint member in the feed direction acting as a pivot point, and

an upwardly angled guide surface adjacent said first hopper for guiding the trailing edge, and

a gate, operable in response to a feed signal developed by said operating station, adjacent said guide for restraining rotation about said pivot point;

means for feeding the separated envelope past said operating station;

second hopper means disposed directly over said first hopper;

second means; positioned between said operating station and said second hopper means, for pivoting said envelope 90°, and

means for conveying said envelope to said second hopper.

4,371,158

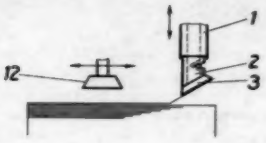
SHEET TILTING SUCTION TYPE SEPARATOR

Karl Marx, Radebeul; Klaus Winkler, Coswig; Kurt Schmidt, and Joachim Jentzsch, both of Karl-Marx-Stadt, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 16, 1980, Ser. No. 160,100
Claims priority, application German Democratic Rep., Mar. 26, 1979, 211780
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—103 3 Claims

1. A tiltable suction type sheet separaor for use in a feeding apparatus of a sheet manufacturing or processing machine, comprising a rigid base body supported for a reciprocating movement in a vertical direction relative to a stack of sheets, a suction member connected to said body and including a downwardly projecting hollow cylinder of an elastomeric material, the center axis of the inner surface of said hollow cylinder being offset from the center axis of the outer surface to provide a cylindrical wall of a circumferentially varying thickness, said cylindrical wall having in the range of its smallest thickness a

single recessed constriction extending in a plane which is parallel to the base plane of the hollow cylinder, said constriction



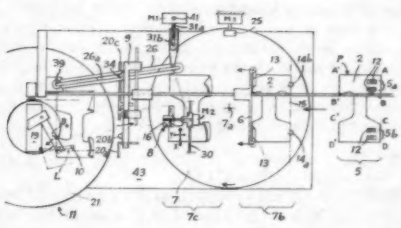
having the form of an annular section the radius of which exceeds the radius of said outer cylindrical surface.

4,371,159

HANDLING INSTALLATION FOR BRINGING A PIECE TO A RECEIVING STATION IN A PREDETERMINED POSITION

Joël Doyen, Ste Savine, and Jean-Pierre Raisin, Troyes, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly sur Seine, France

Filed May 21, 1980, Ser. No. 151,822
Claims priority, application France, May 29, 1979, 79 13658
Int. Cl.³ B65H *9/10, 5/16*
U.S. Cl. 271—228 **13 Claims**



1. A handling installation for transporting a piece of fabric from a first station in an approximate position to a second station in a predetermined position, comprising:

a generally planar surface extending between the first and the second stations on which the fabric can slide;

a transfer carriage movable over the planar surface between a first position wherein the transfer carriage is at the first station and a second position wherein the transfer carriage is at the second station, gripping means carried by the transfer carriage and selectively movable into and out of gripping contact with the fabric resting on the planar surface, the second position having a predetermined fixed position, the first position being translatable along two non-parallel directions of a plane parallel to the planar surface;

locating means mounted above the planar surface to supply position information relative to the position of a predetermined reference point of the fabric at the first station; and

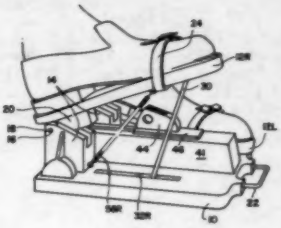
correcting means operably connected to the transfer carriage for adjusting the first position of the transfer carriage in the two directions in response to the position information from the locating means so that the position of the transfer carriage in the first position relative to the position of the fabric at the first station is identical to the position of the transfer carriage in the second position relative to the predetermined fixed position of the fabric at the second station.

4,371,160

EXERCISE DEVICE FOR RUNNERS

Michael L. Shooltz, 191 Hamilton St., Cambridge, Mass. 02139

Filed Mar. 4, 1981, Ser. No. 240,478
Int. Cl.³ A63B *23/04, 21/04*
U.S. Cl. 272—96 **5 Claims**



1. A foot and leg exercise device including:

A. a supporting base;

B. a supporting block attached to the base at one end;

C. a foot pad having a heel pivotally connected to and elevated by the block;

D. a restraining means attached to the foot pad for holding the user's foot on the pad; and

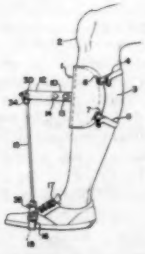
E. a biasing means attached to the base and to the foot pad for exerting downward pressure on the foot pad to resist upward pivotal movement of the user's foot, the biasing means including a path-defining member on the base and a sliding shock cord that is attached to the foot pad at one end, is trained around the path-defining member for sliding with respect to it, and is secured at the other end to require stretching of the shock cord when the foot pad is pivoted away from the base.

4,371,161

ANKLE AND FOOT EXERCISE APPARATUS

Victor N. Williams, 2913 Peregoy Dr., Kensington, Md. 20795

Filed May 5, 1981, Ser. No. 260,791
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—96 **4 Claims**



1. An ankle and foot exercise apparatus comprising:

a rigid member adapted to be connected to the lower leg; a support arm connected to said rigid member; a flexible member adapted to be connected to the ball of the foot; an elastic member having a top end and a bottom end; connecting means for attaching the top end of said elastic member to said support arm; and connecting means for attaching the bottom end of said elastic member to said flexible member; wherein the said rigid member comprises a base plate formed to fit snugly over the leg shin bone; straps for attaching said base plate to said leg; two side supports permanently affixed to said base plate, with each

side support having therein a first hole and a second hole, with said first hole being located closer to said base plate than said second hole; said support arm having a first hole and a second hole; and bolt and pin means for connecting said support arm to said side supports.

4,371,162

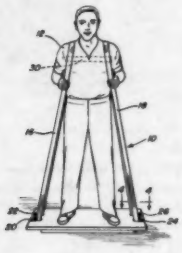
EXERCISING DEVICE

Richard P. Hartzell, 255 Westville Lake Rd., Beloit, Ohio 44609

Filed Apr. 3, 1981, Ser. No. 250,652

Int. Cl.³ A63B *21/12, 21/16, 21/20*

U.S. Cl. 272—134 **11 Claims**



5. An exercising device comprising a rigid footboard having a planar upper surface on which a user can be positioned when exercising, a base underlying a major portion of the footboard and including a planar lower surface parallel to the upper surface, said lower surface of the base engaging a support surface to provide stable support for the footboard when a user engages the footboard in an off center position, said footboard including a pair of opposed end edges with each end edge including a pair of inwardly extending slots extending inwardly from the end edge and terminating adjacent the end of the base, the upper surface of the footboard being free of obstructions and the slots being disposed centrally of the end edges, said pair of slots at one end of the footboard being spaced from the slots at the other end of the footboard a distance to receive the feet of a user when standing in a normal stance with the feet spaced apart thereby enabling a user to position his feet in various positions on the upper surface of the footboard including positions parallel to the end edges and perpendicular thereto without encountering obstructions, an elastic strap of one-piece endless construction having a portion thereof received in one pair of slots with the remaining portion extending above the footboard for engagement by a user, said strap having a rectangular cross-sectional configuration for comfortably engaging body surface areas of a user, said strap being readily detachable from the slots to enable selective use of straps having different dimensional characteristics and strength characteristics to enable a user to practice various exercising programs by the user changing position on the footboard and changing relationship with the strap.

4,371,163

BOWLER'S WRIST AND FINGER CONTROL DEVICE

Robert L. Shaffer, 10439 Greenview Rd., Columbia Station, Ohio 44028, and Richard W. Heckman, 1170 Cahoon Rd., Westlake, Ohio 44145

Filed Nov. 26, 1980, Ser. No. 210,831

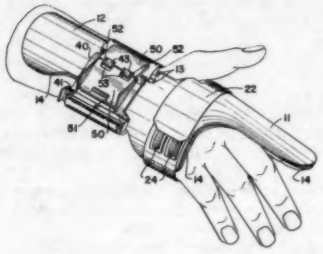
Int. Cl.³ A63B *69/00*

U.S. Cl. 273—54 B **1 Claim**

1. A wrist and forefinger support for a bowler, comprising

a rigid support body provided with a layer of resilient material between said support body and said bowler's hand, said rigid support body adapted to extend dorsally from said bowler's forefinger to a location on his forearm above his wrist, and having a proximal and a distal portion,

said distal portion extending over the entire length of said bowler's forefinger only, and being cylindrically curved concavely downward so that it curves generally around, and partially encases, the forefinger, said proximal portion having a hand covering portion covering said bowler's hand and a wrist covering portion covering his wrist, said hand covering portion being transversely widened to cover essentially the entire dorsal surface of the bowler's hand, including the area extending from the base of the little finger to the base of the forefinger, said proximal portion extending dorsally over a portion of said bowler's forearm, and curving cylindrically to fit generally around said hand, wrist and forearm;



strap means to secure said support body firmly but removably against said bowler's hand and wrist;

said support means and strap means being so constructed as to restrict the backwards movement of said bowler's hand to a range of from and including zero degrees, with respect to the axis of said bowler's forearm, up to five degrees forward, and being so constructed as to restrict the backwards movement of said bowler's forefinger to an optimal angular range of 15 to 20 degrees forward, with respect to the axis of said bowler's hand.

4,371,164

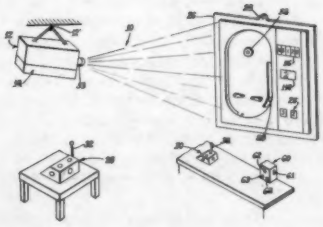
PROJECTED GAMING METHOD AND APPARATUS

Ronald D. Halliburton, Fort Lauderdale, Fla., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Feb. 19, 1980, Ser. No. 122,748

Int. Cl.³ A63D *3/02*

U.S. Cl. 273—121 A **10 Claims**



1. A projected gaming apparatus comprising:

an opaque projector;

a screen positioned to receive projected images from said opaque projector;

at least one three-dimensional game of skill having a viewable face that presents an opaque image positioned in said opaque projector for display of said viewable face on said screen, and

at least one player control unit for controlling events in said game, said player control unit connected to said game and

said projector to control the operation of said projector and said game while the image of said viewable face is displayed on said screen for viewing.

4,371,165

TOP DICE ROULETTE GAME

Bobby J. Tammen, Rte. 2-Box 233, Colorado City, Tex. 79512

Division of Ser. No. 175,146, Aug. 4, 1980, Pat. No. 4,299,592.
This application Jun. 18, 1981, Ser. No. 275,142
Int. Cl.³ A63F 9/16
U.S. Cl. 273—147 **1 Claim**

1. A chance member for simultaneously casting, a plurality of game commands and/or indicia comprising:

a shaft having one end pointed so that the chance member can be easily spun on said point;

two cylindrically-shaped sections removably mounted on said shaft, each having a top, a base, a longitudinal bore and a circumferential periphery;

wherein each said periphery is divided into a plurality of longitudinal faces, each face extending from said top to said base;

wherein one game command or one indicia is on each face of said sections;

wherein said shaft of said chance member is of increasing radius near the pointed end providing a removable friction fit for said shaft in the longitudinal bore of one of said sections so that said sections does not rotate about said shaft when said chance member is spun, thereby providing a sufficient mass near the pointed end to give stability to the spinning member;

wherein the tops of said sections each have a washer-shaped spacer permanently affixed thereto, which facilitates freedom of rotation of one of said sections when it is mounted on said shaft so that its base rests on the top of the other of said sections;

a means for removably and rotatably mounting the base of one of said sections, when a second section is desired to be used, to the spacer at the top of the other of said sections so that when the chance member is spun, the second section may rotate about said shaft relative to the first section without slipping off the shaft, the chance member coming to a stop with one face of each section directed face up;

wherein said mounting means includes a resilient annular bushing that is friction-fitted around said shaft above the second section; and

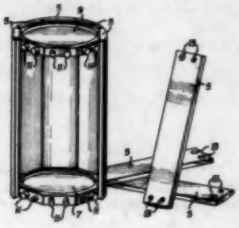
wherein said sections are identically-shaped so that their mounting positions are interchangeable for singular use or in combination with each other.

4,371,166

CYLINDRICAL PUZZLE

Daniel B. Ferris, New York, N.Y.; Martin M. Trossman, Washington Township, Washington County, N.J., and Charles R. Luchsinger, Glen Cove, N.Y., assignors to Synergistics Research Corporation, New York, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,459
Int. Cl.³ A63F 9/12
U.S. Cl. 273—157 R **12 Claims**



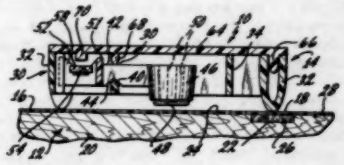
1. A geometric puzzle generally in the shape of a cylinder comprising two end portions and a plurality of removably attached side segments adapted to extend between and connect said end portions, each of said end portions having a plurality of first attaching means and each of said side segments having at least one second attaching means disposed at each end thereof configured to mate with certain ones of said first attaching means, such that said side segments may be connected to said end portions with said certain ones of said first attaching means mating with said second attaching means to thereby form a cylindrical structure, and a cylindrical cardboard sleeve which fits over the connected end portions and side segments.

4,371,167

PSYCHOGRAPHS WITH SOUND PRODUCING MEMBERS

Edward D. O'Brian, 2125 W. Falmouth Ave., Anaheim, Calif. 92801

Filed Jul. 1, 1980, Ser. No. 164,924
Int. Cl.³ A63F 9/18
U.S. Cl. 273—161 **9 Claims**



1. A psychograph including a bottom member having an upper surface and a planchette capable of being moved relative to said upper surface in which the improvement comprises:

a plurality of indicia located on said upper surface of said bottom member, said indicia being spaced from one another,

a magnetic means located on said planchette so as to be movable relative to said planchette,

a plurality of other magnetic means capable of magnetic interaction with said magnetic means on said planchette each of said means capable of magnetic interaction being located adjacent to one of said indicia,

each of said magnetic means capable of magnetic interaction being located on said bottom member,

said planchette includes a viewing means for designating

only a specific one of said indicia at any one time in accordance with the position of said planchette on said upper surface,

said permanent magnet being located on said planchette in a position in which it will be moved in response to magnetic interaction with one of said other magnetic means when said planchette is in a position to designate a specific one of said indicia,

at least one sound producing means located on said planchette for producing a sound in response to movement of said magnetic means on said planchette with respect to said planchette,

at least one of said magnetic means comprising a permanent magnet,

said position having a predetermined meaning which is associated only with the use of said psychograph.

4,371,168

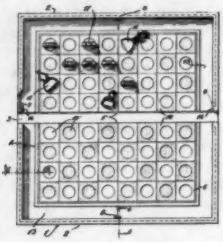
POCKET-SIZE CHESS GAME

Robert C. Dupuis, 532 du Roi St., Quebec, Canada (G1K 2X2)

Filed Jun. 8, 1981, Ser. No. 271,633

Int. Cl.³ A63F *3/01*

U.S. Cl. 273—239 **6 Claims**



1. A pocket-size chess set comprising a pair of identical flat and generally rectangular panels; a third narrow, intermediate panel, each of the said pair of panels having an inner edge pivotally secured to one side of said third panel, the latter extending between said inner edges of said pair of panels; each of said pair of panels having a top surface, said top surface being provided with half a slidable checkerboard; each said half being made of a para-magnetic material and slidable from a first retracted position and a second play position, wherein their inner sides touch over said third panel, forming a complete checkerboard; means to slidably retain each said half on each said top surface; means to limit the inward movement of each said checkerboard half when the latter are in play position; further comprising a set of thirty-two chessmen; each said chessman having a back surface provided with a small permanent magnet which projects slightly below the bottom of each said chessman, whereby said chessmen may be placed either vertically or horizontally on said checkerboard halves, each of the latter having a lateral and outer side margin for the placing of captured chessmen thereon during the course of a game.

4,371,169

IMAGINARY MULTI-LEVEL TICKTACKTOE

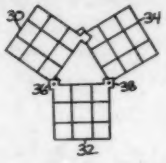
A. Berkeley Compton, 3420 Windsor Ct., Pleasanton, Calif. 94566

Filed Nov. 3, 1980, Ser. No. 203,368

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—271 **10 Claims**

1. A tictactoe game comprising at least three tictactoe boards, each board comprising at least nine locations arranged in a common geometric pattern, each location comprising means for temporarily retaining a removable indication of either of two different types thereon, said boards each having a rectangular shape and being substantially planar, means attaching said boards to form a substantially planar array such that at least one of said boards is contiguous to the other two, said means comprising pivotable attachment means at at least two respective corners of said one board and at at least one



corner of each of said other two boards for attaching said boards such that they can be rotated with respect to each other in a plane parallel to their planarity.

4,371,170

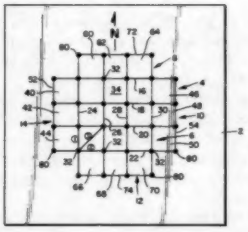
ALIGNMENT GAME WITH CROSS SHAPED PLAYING FIELD

Francisco Acevedo, Caguas, P.R., assignor to Commonwealth of Puerto Rico, San Juan, P.R.

Filed Mar. 24, 1981, Ser. No. 247,107

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—271 **1 Claim**



1. A game to be played by two or four players in accordance with rules, comprising the following parts,

(a) a game board having marked thereon a cross shaped playing field consisting in its entirety of

i. a square central area subdivided into nine squares of equal size by four north-south extending lines and four east-west extending lines providing sixteen points of intersection,

ii. each of the north-south lines being extended beyond the central area to provide both north and south of the central area three squares which are equal in size to the squares of the central area bounded at the north or south extremity by east-west extending lines defining four points of intersection with the north-south extending lines,

iii. each of the east-west lines being extended beyond the central area to provide both east and west of the central area three squares which are equal in size to the squares of the central area bounded at the east or west extremity by north-south extending lines defining four points of intersection with the east-west extending lines,

(b) two sets of visually differentiated movable play pieces,

(c) at least one die, and

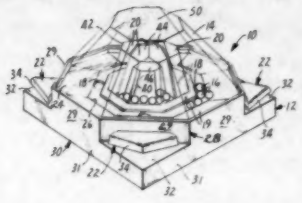
(d) a set of rules by which the play pieces are moved to points of intersection.

4,371,171

SELF-CONTAINED GAME

Gary S. Silverman, Plymouth; Robert D. Zera, Minneapolis; James F. Kubiatowicz, Fridley, and Robert L. Claussen, Crystal, all of Minn., assignors to Custom Concepts Incorporated, Minneapolis, Minn.

Filed Dec. 8, 1980, Ser. No. 214,044
Int. Cl.³ A63F 9/02
U.S. Cl. 273—357 4 Claims



1. A self-contained game comprising a base; an at least partially transparent dome mounted on the base to provide a single enclosed space therebetween; and a plurality of freely movable generally spherical similarly sized objects within the space; said space having a plurality of sockets opening into said single space, each adapted to receive one of the objects, and an upper surface having portions adjacent each socket shaped so that the objects will be guided via gravity to the adjacent socket; and said game further including open-topped receptacles generally centrally located on the base within said single space with a different one of said receptacles adjacent each of said sockets; and a plurality of levers each comprising an impact portion adapted to be impacted, and a hammer portion, each lever being pivotably mounted on said base with said impact portion accessible outside said dome and said hammer portion adjacent a different one of said sockets on the side of said base opposite said upper surface for pivotable movement from a normal position to which said hammer is biased with said hammer spaced from said socket, to an impact position with said hammer portion at said socket, so that said levers may be manually moved from their normal to their impact positions by players to impart force to objects in the sockets, causing the objects to fly upwardly into the space in an attempt by the players to propel the objects into the receptacles; said receptacles each including a lower portion defined by inner and outer generally vertical walls spaced at a distance only slightly exceeding the diameter of said objects and by side walls spaced a distance exceeding a multiple of said diameter so that objects in said receptacle will be disposed generally vertically and side by side between said walls, said outer wall being transparent to afford viewing and counting of said objects between said walls through said dome and outer wall.

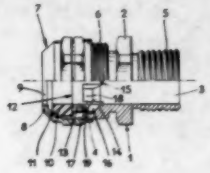
4,371,172

ANCHORING AND SEALING COUPLING FOR A CABLE

Robert de Vienne, Paris, France, assignor to Capri-Codec SA, Colombes, France

Filed Mar. 3, 1981, Ser. No. 240,125
Claims priority, application France, Dec. 30, 1980, 80 27752
Int. Cl.³ F16J 15/12; F16L 21/04
U.S. Cl. 277—12 10 Claims

1. An anchoring and sealing coupling for a cable comprising a tubular main body, means on said body for fixing said body to a wall, an axial channel extending through said body terminated at one end by a conical flared portion, an annular nut threadedly engaging on to said one end of the body encircling said conical flared portion, the outer end of said nut having an axial bore therethrough of diameter similar to the diameter of said axial channel, a deformable sealing ring within the interior of said nut and supported thereby adjacent said outer end, said sealing ring comprising a cylindrical washer of thermoplastic or elastomeric material, an annular clip between said sealing ring and said conical flared portion for anchoring a cable extending through said tubular body and nut, said annular clip comprising a cylindrical annular base having an externally conically shaped radially slotted portion extending therefrom of plastically deformable material, and an external annular



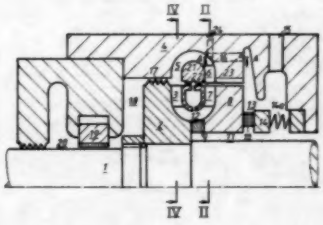
groove at the juncture of said base and slotted portion, the radial slots extending into said groove, whereby tightening of said nut deforms said sealing ring causing the sealing ring to move said conically shaped slotted portion of said clip against said conical flared portion of said main body to force said radially slotted portion radially inwardly into engagement with the cable.

4,371,173

FLUID-LOCKED SHAFT SEAL OF REDUCED SLIDING SPEED

Joachim Kotzur, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnburg Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,299
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116762
Int. Cl.³ F16J 15/36, 15/38; F01D 11/00; F04D 29/12
U.S. Cl. 277—12 6 Claims



1. A fluid-locked shaft seal, comprising a housing, a rotating shaft in said housing, a seal ring in said housing affixed to said shaft for rotation therewith, a packing ring disposed in said housing around said shaft and fixed radially in respect to said shaft, flexible means connected between said packing ring and said housing permitting flexible axial movement of said packing ring relative to said housing, a slide ring in said housing around said shaft between said seal ring and said packing and connected to said shaft for rotation at substantially half the speed of rotation of said shaft, a pump rotor formed with said seal ring disposed on its side adjacent said slide ring generating a fluid flow, said housing and said seal ring and slide ring defining a deflection channel, a plurality of stationary impellers disposed in said deflection channel, wherein said slide ring has a turbine wheel disposed in said channel.

4,371,174

COMPRESSION RINGS FOR PISTONS

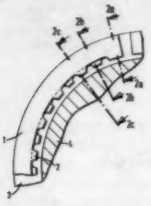
Rudolf W. Gärtler, Weinstadt, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 219,833

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1980, 3000146

Int. Cl.³ F16J 15/20

U.S. Cl. 277—24 8 Claims



1. In a compression ring for pistons of internal combustion engines the provision of:

(a) a plurality of projections distributed over the inner circumference of the compression ring to form a series of sharp edges.

(b) said sharp edges being so aligned that, when the compression ring rotates in a piston ring groove, they act in a scraping manner with respect to deposits disposed in the radial bottom of such a groove,

(c) flanks are associated with sharp edges which are aligned in such a way that the forces of the gases flowing around the compression ring act on the flanks to bring about a rotation of the compression ring.

4,371,175

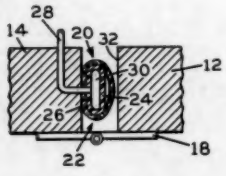
INFLATABLE GASKET FOR RADIO FREQUENCY SHIELDING ENCLOSURE

Garritt C. Van Dyk, Jr., Bethel, Conn., assignor to Keene Corporation, Norwalk, Conn.

Filed Aug. 18, 1981, Ser. No. 294,015

Int. Cl.³ F16J 15/12, 15/46; H05K 9/00

U.S. Cl. 277—34 8 Claims



1. An inflatable gasket for providing an electrically conductive seal between first and second adjacent conductive sections of a shielding enclosure comprising:

(a) an inflatable elastomeric tube secured to a substantially planar surface of said first section and aligned in close proximity to the periphery of said first section, said tube having a flattened cross-section having a major axis extending parallel to said planer surface and a minor axis when uninflated and becoming elongate in the direction of said minor axis when inflated;

(b) a loosely fitting flexible deformable shielding medium surrounding said tube; and

(c) means through which said tube may be inflated and deflated whereby shielding medium is deformed into contact with said second section when said tube is inflated and is deformed out of contact with said second section when deflated.

4,371,176

SEALING CONSTRUCTION FOR ROTATING PORTIONS AT A BICYCLE

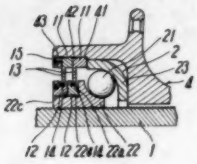
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 6, 1980, Ser. No. 157,027

Claims priority, application Japan, Jun. 20, 1979, 54-85325[U]

Int. Cl.³ F16J 15/44

U.S. Cl. 277—56 7 Claims



1. A bicycle hub comprising a hub shaft, a pair of ball holders screwed with said hub shaft, balls supported to said ball holders, ball races receiving said balls, and a hub shell rotatably supported to said hub shaft through said balls, said bicycle hub having at least one first sealing member of ring-like shape, and at least one second sealing member of ring-like shape mounted adjacent to a first sealing member, each said first sealing member being larger in diameter than each said second sealing member, each said first sealing member being supported on the inner periphery of said hub shell and having a first annular projection extending radially inwardly from an inner periphery thereof, at least one of said ball holders having an extension which projects axially outwardly through a stepped portion, each said second sealing member having an inner diameter slightly larger than said extension of said ball holders, and being supported to said extension of said ball holder and having a second annular projection extending radially outwardly from the outer periphery thereof, said second annular projection having an outer diameter larger than an inner diameter of said first annular projection.

4,371,177

SELF-LOCKING SEALING AND WIPER RING

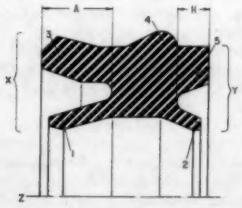
Günter Bähr, Weinheim; Erich Habel, Fürth, and Werner Hafner, Leimen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 8, 1981, Ser. No. 309,801

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039534

Int. Cl.³ F16J 15/32

U.S. Cl. 277—152 6 Claims



1. A self-locking sealing and wiper ring of elastomer material for pressure differential shaft sealing, which comprises a cylindrical body having a bore, inside and outside faces approxi-

mately perpendicular to the bore axis and an annular support projection joining the outside wall of the body; said inside face having inner and outer sealing lips disposed around its inner and outer diameters respectively; said outer face having an inner wiper lip disposed around its inner diameter and an outer support arm disposed around its outer diameter; and said projection having a circular arc shape in the cross section profile on the projection side directed toward the outside face and having a tapered shape in the cross section profile on the other side which is sloped at an angle of about 20° to about 40° relative to the bore axis.

4,371,178

SEALING ARRANGEMENT, PARTICULARLY FOR SEALING VALVE PISTON RELATIVE TO VALVE HOUSING

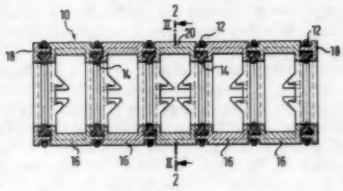
Helmut Ott, Stuttgart, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,898

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002715

Int. Cl.³ F16K *3/24*; F16J *15/56*

U.S. Cl. 277—154 **18 Claims**



1. A sealing arrangement, particularly for sealing a valve piston relative to a valve housing having an axis, comprising a plurality of sealing rings arranged to be located between a valve piston and a valve housing, and axially spaced from each other; and a plurality of supporting rings located axially adjacent to each other and arranged to support and hold said sealing rings, said supporting rings being connected with said sealing rings in interengaging manner so as to form together with the same an integral unit which can be mounted and dismounted as a whole, each of said supporting rings having a body part with two axial sides and being provided with a first formation at one of said sides and a second formation on the other of said sides of said body part, said formations being arranged so that when two neighboring supporting rings are assembled with one another, the first formation of one of said neighboring supporting rings engages with the second formation of the other of said neighboring supporting rings.

4,371,179

T-SHAPED SEALING RING WITH ELONGATED LIP

Nils-Erik Bohman, Lillegard, Fänestad, Forsheda, Sweden

Filed May 12, 1981, Ser. No. 262,805

Claims priority, application Sweden, May 23, 1980, 8003870

Int. Cl.³ F16J *15/32*

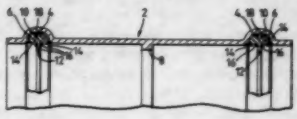
U.S. Cl. 277—207 A **5 Claims**

1. A sealing ring for forming a seal between two substantially cylindrical surfaces, comprising:

an annular main portion having two radial faces, one of the radial faces adapted to engage one of the cylindrical surfaces and the other radial face having a pair of spaced apart annular grooves;

a pair of annular engaging portions extending radially from the other radial face of said annular main portion, each of said annular engaging portions located outwardly of each of the grooves; and

an elongated sealing lip projecting radially from the other radial face of said annular main portion, intermediate and parallel to the pair of grooves, a free end portion of said elongated sealing lip adapted to engage one of said annular



portions when deflected and compressed by the other cylindrical surface.

4,371,180

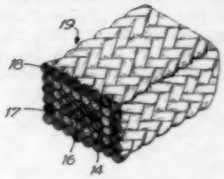
GASKET MATERIAL

Edward M. Case, Weston, and Chester S. Hopper, Newtown, both of Conn., assignors to The Marlo Company Incorporated, Newton, Conn.

Filed Mar. 24, 1980, Ser. No. 133,048

Int. Cl.³ F16J *9/20, 15/22*

U.S. Cl. 277—230 **2 Claims**



1. A gasket material consisting essentially of a braided sleeve of organic and vitreous fiber, said organic fiber providing the major portion of the conformability of said gasket and said vitreous fiber reinforceing said gasket against internal pressure, and an impregnant selected from the group consisting of dispersed polytetrafluoroethylene (TFE) and starch, wherein said sleeve comprises a braided base sleeve of vitreous fiber and an outer sleeve of organic fiber over said base sleeve, said impregnant being in all sleeves.

4,371,181

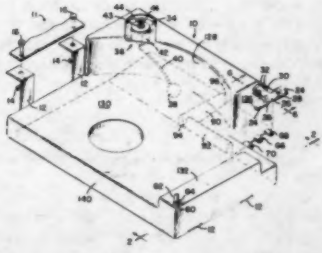
COLLISION RESISTANT AUXILIARY FUEL SYSTEM

Ray A. Monigold, 3226 193rd Pl. SE., Bothell, Wash. 98011, and William F. Russell, 9415 SE. 52nd St., Mercer Island, Wash. 98040

Filed Apr. 29, 1980, Ser. No. 144,886

Int. Cl.³ B60K *15/02*

U.S. Cl. 280—5 A **12 Claims**



5. A collision resistant fuel system for a motor vehicle, wherein the fuel system has an enhanced ability to survive a

rear end collision of the vehicle on which it is mounted, the fuel system comprising:

a fuel tank; and

mounting means for releasably securing the fuel tank to the exterior of the bottom of the rear portion of the vehicle;

wherein the mounting means are for securely holding the fuel tank in place during normal operation of the vehicle;

wherein the mounting means are for at least partially releasing the fuel tank to permit forward movement of the fuel tank relative to the vehicle during said rear end collision of the vehicle to help avoid the crushing and rupturing of the fuel tank which might otherwise occur; and

wherein the fuel tank is located rearwardly of a transverse member of the vehicle, and the fuel tank includes an inclined wall on its forward portion which, during said movement of the fuel tank during said collision, is adapted to strike said transverse member, forcing the fuel tank to move downwardly as it moves forwardly, to help prevent the fuel tank from being crushed against the transverse member during said collision.

4,371,182

VEHICLE SUSPENSION SYSTEM

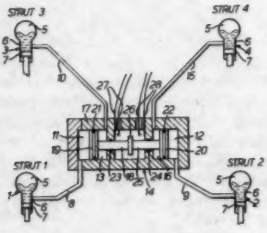
Peter W. Brown, Leicestershire, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 9, 1981, Ser. No. 232,688

Claims priority, application United Kingdom, Mar. 5, 1980, 8007465

Int. Cl.³ B60G *13/08*

U.S. Cl. 280—6 H **7 Claims**



1. A vehicle suspension system for a vehicle having four ground engaging wheels, the suspension system comprising: a variable length suspension strut for each of said ground engaging wheels; detector means for detecting departure of the vehicle body from a datum zone which is fixed relative to a datum plane defined by three points on the unsprung portions of the vehicle suspension; means responsive to said detector means for controlling the effective length of three of said struts to restore the vehicle body to the datum zone; and means for adjusting the force exerted by the fourth strut to such a value that for any loading of the vehicle the ground reaction of the wheel associated with the fourth strut satisfies the condition:

$$R_4 = R_3 + k(R_2 - R_1)$$

where

R_4 = ground reaction of the wheel associated with the fourth strut

R_3 = ground reaction of the other wheel at the same end of the vehicle as the wheel associated with the fourth strut

R_2 = ground reaction of the other wheel at the same side of the vehicle as the wheel associated with the fourth strut

R_1 = ground reaction of the wheel diametrically opposed to the wheel associated with the fourth strut

k = a constant.

4,371,183

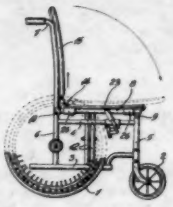
FOLDING WHEEL-CHAIR

Jean-Paul Dion, 327 - 21st St., Quebec, Canada (G1L 1X6)

Filed Dec. 22, 1980, Ser. No. 218,808

Int. Cl.³ B62B *11/00*

U.S. Cl. 280—42 **8 Claims**



1. A folding wheel-chair operatively comprising a pair of opposite sides, an articulated bracing hinged to the opposite sides and folding therewith from an unfolded position to a folded position of the opposite sides with the latter, in their folded position, extending in laterally closer spaced-apart relationship, each of said opposite sides including a seat-carrying rod longitudinally extending in the fore and aft direction, a rigid base seat, at least one offsetting arm longitudinally extending laterally relative to said opposite sides and having an inner end pivotally connected to the rigid base seat under the same and intermediate its side edges, and an outer end pivotally connected to the seat-carrying rod of one of said opposite sides, with said one offsetting arm longitudinally extending laterally under the rigid base seat in supporting relationship therewith in the unfolded position of said opposite sides and upwardly and laterally offsetting the rigid base seat relative to said one side edge of said rigid base seat in the folded position of said opposite sides, a support device fixedly secured to said rigid base seat adjacent its other side edge and including a cylindrically concave bottom portion axially extending in the fore and aft direction for removably resting operatively onto the seat-carrying rod on the other of said opposite sides in the unfolded position of said opposite sides, and a rigid base backrest hinged to the rigid base seat and operatively foldable from an erected operative position to a folded inoperative position over the rigid base seat.

4,371,184

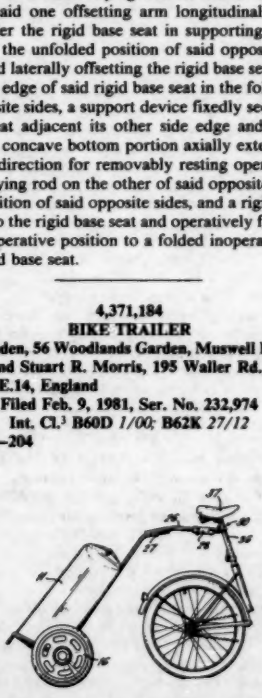
BIKE TRAILER

Derek J. Henden, 56 Woodlands Garden, Muswell Hill, London, England, and Stuart R. Morris, 195 Waller Rd., New Cross, London, S.E.14, England

Filed Feb. 9, 1981, Ser. No. 232,974

Int. Cl.³ B60D *1/00*; B62K *27/12*

U.S. Cl. 280—204 **12 Claims**



1. A lightweight trailer having a body to support a pay-load, a pair of wheels, a draw-bar extending from the body for attachment to a towing vehicle and a coupling for releasably

connecting the free end of the draw-bar to a part of the towing vehicle comprising a spigot having means for attachment to a part of the towing vehicle and a flexible tubular element the respective ends of which receive the free end of the draw bar and spigot and means to fix the tubular element to one of the spigot and draw bar and to provide a releasable connection between the tubular element and the other of the spigot and draw-bar so that the trailer can be separated from the towing vehicle when required and the flexible tubular element can cater for variation in attitude between the towing vehicle and trailer.

4,371,185

TWO-WHEELED VEHICLE

Hans G. Bals, Blümgesgrund 44, Gelnhausen, Fed. Rep. of Germany

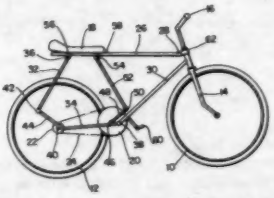
Continuation of Ser. No. 927,004, Jul. 24, 1978, Pat. No. 4,266,794. This application Apr. 14, 1981, Ser. No. 254,073

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734560

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ B62M *1/20*; A63B *69/16*

U.S. Cl. 280—227 **5 Claims**



1. An exercising device comprising a frame including upper, lower, front and rear frame members, pivotable joint means connecting said upper frame member and said lower frame member to said front frame member, pivotable joint means connecting said upper frame member and said lower frame member to said rear frame member, a saddle carried on said upper frame member, handle bars mounted on said front frame member, a stand for supporting the lower frame member, an axle mounted in said stand and pivotally supporting said lower frame member, the rear portion of said lower frame member extending beyond the axle to said pivotable joint means connecting said lower frame member to said rear frame member, and pedals connected to one of the front frame and lower frame members.

4,371,186

ARTICULATION FOR VEHICLE, ESPECIALLY AN ARTICULATED BUS

Gerard Queveau, and Christian Cheron, both of 7, rue Louis Heuliez, 79140 Cerizay, France

Filed Jan. 7, 1981, Ser. No. 223,144

Claims priority, application France, Jan. 7, 1980, 80 00215

Int. Cl.³ B60D *1/00*

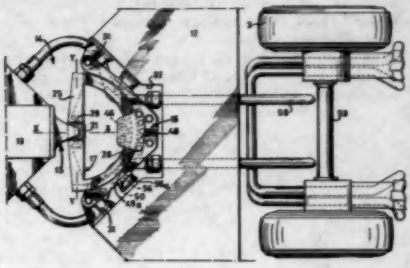
U.S. Cl. 280—432 **21 Claims**

1. In an articulated vehicle of the type comprising a forward section with at least one axle and a rear section also with at least one axle, the forward and rear sections being interconnected by an articulation having three degrees of freedom, an improved articulation comprising:

a first element affixed to one of the vehicle sections:

a second element affixed to the other of the vehicle sections; and

an intermediate element, each of the elements presenting mean main planes which, with the vehicle on a horizontal surface, blend into a single horizontal plane, the first element being articulated on the intermediate element both around a longitudinal horizontal axis and around a transverse horizontal axis, the intermediate element comprising first and second vertical arcuate surfaces, each of the arcuate surfaces being concentric with a vertical axis, the first surface being convex and directed toward the second element and the second surface being concave and directed toward the first element, the second element further comprising means for engaging the first and second vertical arcuate surfaces to confine the intermediate element to articulation relative to the second element around the vertical axis.



4,371,187

SKI BRAKE

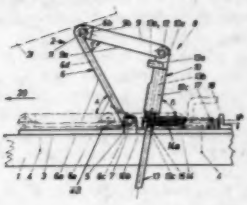
Josef Svoboda, and Emilie Szabo, both of Schwechat, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Oct. 24, 1980, Ser. No. 200,121

Claims priority, application Austria, Oct. 25, 1979, 6933/79

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **17 Claims**



1. In a ski brake mountable on a ski, having a pedal supported on a base for pivotal movement between a braking position and a retracted position, and having two braking arms which each have one section which in the retracted position extends parallel to the longitudinal axis of the ski and is movably supported in said pedal and a second section which is parallel to and offset from said one section and can be swung in and out relative to the longitudinal axis of the ski, said pedal being pivotal against the force of a spring about a swivel axle which extends at substantially a right angle to the longitudinal axis of the ski and is supported on said base, the improvement comprising wherein said pedal includes frist and second parts which are pivotally coupled to one another, said braking arms being movably supported on said first pedal part, said swivel axle pivotally supporting said first pedal part at a location thereon spaced from said pivotal connection to said second pedal part, wherein said swivel axle is guidedly supported in a slide bearing for movement longitudinally of the ski, wherein said second pedal part is movably coupled at a location thereon spaced from said pivotal connection to said first pedal part to one end of an elongate bar, the other end of said bar being supported on said base for pivotal movement about a fixed axis

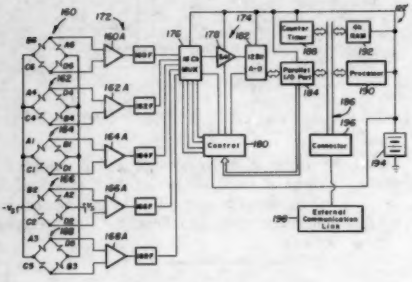
which extends substantially at a right angle with respect to the longitudinal axis of the ski, and wherein said first and second parts of said pedal and said bar form a toggle-joint system.

4,371,188

METHOD FOR PROGRAMMED RELEASE IN SKI BINDINGS

Maury L. Hull, Davis, Calif., assignor to University of California, Berkeley, Calif.

Filed Jun. 24, 1980, Ser. No. 162,413
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—613 **1 Claim**



1. In a ski binding for releasably securing a ski boot to a ski, a method for minimizing injuries in a lower extremity of a skier, said method comprising:

measuring a plurality of mechanical deflections induced in said ski binding from interaction between said skier and said ski;

developing a plurality of first electrical signals, each of said first signals being determined from a different one of said deflections;

developing a plurality of second electrical signals determined from a relationship between said first signals, said second signals defining a measurement of forces along first selected ones of longitudinal, lateral, and vertical axes of said ski and moments about second selected ones of said axes, said mechanical deflections occurring in response to said forces and said moments; and

computing from said second signals an actual angle of deflection based on a preprogrammed relationship between said second signals, said actual angle of deflection being about a location of said lower extremity of the skier, said location being selected to prevent injury thereto, said computing step including comparing said actual angle of deflection with a predetermined critical angle of deflection to initiate a release of said ski binding in the event said actual angle exceeds said critical angle.

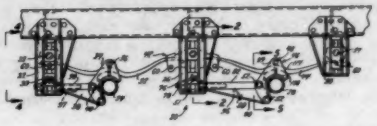
4,371,189

HEAVY VEHICLE SUSPENSION ASSEMBLY WITH FREE FLOATING SPRINGS AND AXLE STABILIZING TORQUE ROD

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Oct. 14, 1980, Ser. No. 196,696
Int. Cl.³ B60G *11/04*
U.S. Cl. 280—682 **17 Claims**

1. A vehicle suspension assembly for supporting a vehicle chassis on a vehicle axle comprising a first and second hanger depending downwardly from said chassis, a leaf spring bearing downwardly on said axle and with its ends bearing upwardly on said hangers, means to maintain said spring in a load bearing relationship to said axle and permit relative sliding movement therebetween, and a torque rod extending between said axle and said first hanger, said torque rod having means to stabilize said axle including means rigidly securing an end of the torque



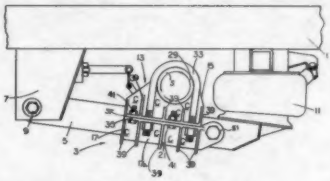
rod to the axle to resist torquing of said axle about its central axis and about the torque rod.

4,371,190

AXLE SUSPENSION SYSTEM

Ervin K. Vandenberg, Massillon, Ohio, assignor to Turner Quick-Lift Corporation, Canton, Ohio

Filed Jan. 28, 1980, Ser. No. 116,339
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—705 **30 Claims**



1. In an axle suspension system of the beam type including a longitudinal beam and further including an airbag and an axle-to-beam connecting member, each located along the beam, the improvement comprising as said axle-to-beam connecting member, a member which includes an axle housing capable of rigidly retaining an axle thereon, a beam housing having located therein a portion of said beam, an elastomeric element located between the beam housing and the portion of said beam located therein, a pin means for pivotally connecting the beam to the axle-to-beam connecting member, said pin means extending transverse to the longitudinal direction of said beam and being located between said member and said beam, and an elastomeric bushing located between said pin and said beam, said pin being located at a longitudinally spaced distance from said beam housing, such that torque forces about the longitudinal center line of an axle when located in said axle housing will effectively cause rotation of said beam housing about the center line of said pin.

4,371,191

ADJUSTING AUTOMOBILE SUSPENSION SYSTEM

Jerome Goldberg, Cold Spring, and Christopher D. Bloch, Hillsdale, both of N.Y., assignors to Springhill Laboratories, Inc., Cold Spring, N.Y.

Continuation-in-part of Ser. No. 826,709, Aug. 22, 1977, Pat. No. 4,191,274. This application Feb. 20, 1980, Ser. No. 123,024
Int. Cl.³ B60G *17/00*
U.S. Cl. 280—707 **18 Claims**

1. An adjusting vehicle suspension system for a vehicle having a chassis and an individual suspension system at each wheel of the vehicle comprising:

sensing means at each wheel of the vehicle to sense the height of the vehicle chassis with respect to each said wheel;

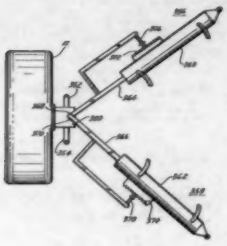
sensing means on said vehicle to sense centrifugal force acting on said vehicle;

sensing means on said vehicle to sense longitudinal forces acting on said vehicle due to acceleration or deceleration;

control means carried by said vehicle to receive sensed

changes in vehicle performance as indicated by the said sensing means;

said control means including means to alter and adjust camber, castor, toe-in/out, or wheel track of each said wheel



with respect to said vehicle chassis to maintain optimum road contact between each said wheel and the road based on a correlation of the factors sensed by said sensing means.

4,371,192

TENSION STOP FOR SAFETY BELT OF THE INERTIA REEL TYPE

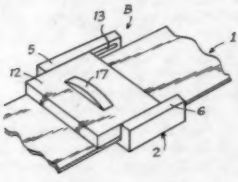
Maurice A. J. Alix, Ecole Nationale des Metiers E.D.F., Gurcy-le-Chatel - Donnemarie-Dontilly, France (77520)

Filed Jan. 6, 1981, Ser. No. 223,012

Claims priority, application France, Jan. 11, 1980, 80 00867

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **6 Claims**



1. In a tension stop for safety belts of the inertia reel type, comprising, on the one hand, a support piece defining a passage for a belt and, on the other hand, a mobile blocking piece adapted to free the passage completely or to project herein to clamp and tighten the belt against the support piece,

the support piece is in the form of a "U" comprising a base with two transverse edges and two raised edges defining the passage with the base, said raised edges being provied with means for retaining the blocking piece and guiding said piece towards a position disengaged with respect to the passage or towards a position projecting inside said passage, and wherein at least one transverse edge is inclined with respect to the axis of slide of the belt in the passage to provide support against the perimeter of a slit through which the safety belt passes,

the blocking piece is constituted by a plate comprising:

means for cooperation with the retaining and guiding means;

an inner clamping face opposite and at a shallow angle to the inner face of the base of the support piece for tightening and clamping the belt between the inner face of the base and the clamping face; and

an outer face provided with an actuating member.

4,371,193

BELT ANTI-SLIP DEVICE FOR VEHICLE SAFETY BELT SYSTEMS

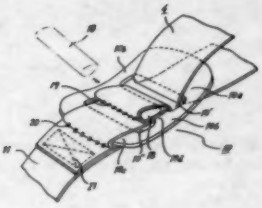
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Oct. 8, 1980, Ser. No. 195,581

Claims priority, application Japan, Oct. 11, 1979, 54-140995; Feb. 18, 1980, 55-018463

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **9 Claims**



1. In a vehicle occupant restraint belt system having a D-ring, a control belt, and a restraint belt, the D-ring including a reflex section partitioning the restraint belt into a shoulder belt section and a lap belt section by passing of the restraint belt through a restraint belt opening in the D-ring and reflexion of the restraint belt from one section to the other, two side sections being connected to each end of the reflex section, an end section at the end of the D-ring opposite the reflex section closing the side sections, and a bridge section bridging the two side sections and forming a restraint belt opening between the bridge section and the reflex section, and a control belt opening between the bridge section and the end section, the improvement of a restraint belt anti-slip device comprising a portion of the control belt being reflexed back on itself to define a U-shaped loop passing through the restraint belt opening in the D-ring, temporary holding means for temporarily holding the control belt loop away from the restraint belt opening in the non-locking position, and a lock member inserted into the control belt loop, the loop and lock member being transferable between a non-locking position and a locking position by tension forces applied through the control belt of a predetermined amount so as to overcome the means for temporarily holding the lock member in the non-locking position, so that when the lock member is in the locking position the lock member wedges in the restraint belt opening against the restraint belt and prevents the lap portion of the restraint belt from passing through the restraint belt opening to the shoulder belt portion.

4,371,194

UNIVERSAL BINDING FOR MAKING VARIABLE SIZED BOOKS AND REPORTS

James C. Waag, Libertyville; Donald Murfitt, Glenview; Paul H. Livingston, Hoffman Estates, and Luis K. Joson, Lincolnwood, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

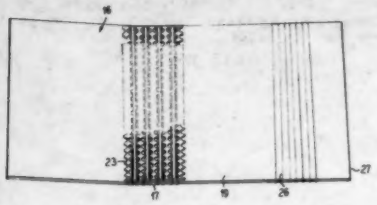
Filed Jun. 24, 1980, Ser. No. 162,507

Int. Cl.³ B42D *3/00*; B42C *9/00*

U.S. Cl. 281—21 R **19 Claims**

1. A book cover structure of the type having front and back covers and sheets bound therebetween, the improvement of a backbone area joined with the front and back covers, the backbone area before binding initially having parallel strips of hot melt adhesive thereon and ribbed rows of hot melt adhesive with each ribbed row alternated with one of said strips of hot melt adhesive across the width of a backbone area, and spaced score lines located between said parallel strips and said ribbed rows in parallel relation relative to one another to enable the front and back covers to be flexed along selectable score lines relative to the backbone area, said ribbed rows of

hot melt adhesive and said strips after being heated comprising means holding said sheets in bound engagement with said backbone area, said ribbed rows of hot melt adhesive initially



extending across the score lines and thus providing adhesive over the associated score line, the covers being folded at a pair of said score lines relative to said backbone area.

4,371,195

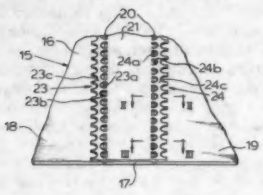
COVER WITH ADHESIVE BRIDGES IN SCORED AREAS

James C. Wang, Libertyville; Donald Murfitt, Glenview, and Paul H. Livingston, Hoffman Estates, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Jun. 24, 1980, Ser. No. 162,608

Int. Cl.³ B42D *3/00*; B42C *9/00*

U.S. Cl. 281—21 R **14 Claims**



1. A book cover structure of the type having a backbone with front and back covers connected to the backbone and separated from the backbone by spaced parallel score lines to enable the front and back covers to flex relative to the backbone, the improvement comprising a backbone strip of hot melt adhesive being secured on an inside face area of said backbone and means for positioning sheets in engagement with said backbone comprising a pair of cover strips of hot melt adhesive secured to inside surface areas of the front and back covers in spaced adjacency to the score lines, and bridge means of hot melt adhesive extending between adjacent strips and across said score lines, said bridge means having substantially reduced adhesive thickness at, and over said score lines.

4,371,196

SECURITY FILAMENT AS PROTECTION AGAINST FRAUD

Walter von Kempski, Leverkusen, and Fritz Kirstein, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,471

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013238

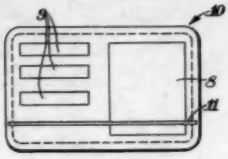
Int. Cl.³ B42D *15/00*

U.S. Cl. 283—7 **8 Claims**

1. In combination,

a thread having longitudinal grooved and raised portion surface formations,

formed into the circumference of the longitudinal thread and providing a visibly identifiable cross-section in said thread,



said surface formations extending longitudinally of said thread along a substantial part of its length,

and a card carrying said thread in a visible position.

4,371,197

PIPELINE FOR CONVEYING HOT OR COLD FLUIDS

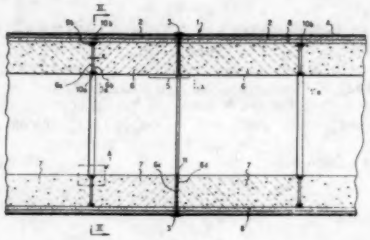
Gilbert Chabrier, Montmorency, France, assignor to Spie-Batignolles, Puteaux, France

Filed Dec. 16, 1980, Ser. No. 217,181

Claims priority, application France, Dec. 27, 1979, 79 31780

Int. Cl.³ F16L *11/12*, *35/00*, *9/22*

U.S. Cl. 285—47 **3 Claims**



1. In a pipeline for conveying hot or cold fluids having metallic and rigid tubes (2), assembled directly end to end, a covering (5) of heat-insulating material formed as sleeves (6) made on the basis of a cement filled with thermically insulating inorganic particles, with said covering being disposed at the interior of said tubes (2) and in direct contact with the fluid conveyed by the pipeline, the improvement comprising: a thickness of said covering (5) of heat-insulating material which is determined in such a way that the expansion or contraction of the tubes (2) upon the introduction of a hot or cold fluid remains compatible in said pipeline with the mechanical resistance of the tubes, and an outer diameter of the sleeves (6) of slightly smaller size than the inner diameter of the tubes (2), with the annular space between said tubes (2) and said sleeves (6) being filled by a sealing material (8), injected under pressure, and being more elastic than the material of the sleeves.

4,371,198

APPARATUS FOR CONNECTING TUBULAR MEMBERS

Charles F. Martin, P.O. Box 197, Porter, Tex. 77365

Division of Ser. No. 738,609, Nov. 3, 1976. This application Mar. 28, 1980, Ser. No. 135,087

Int. Cl.³ F16L *27/06*

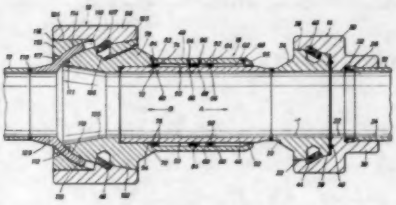
U.S. Cl. 285—165 **28 Claims**

1. A connection apparatus for connecting first and second tubular members comprising:

a female body having a passageway therethrough and first and second ends defining first and second end openings, said female body having an internally formed bearing surface, the second end of said female body being adapted to be connected to said second tubular member;

a male body having a passageway therethrough and first and second ends, said male body having an externally formed bearing surface, said first end of said male body being adapted to be connected to said first tubular member, said second end of said male body being received in said first end opening of said female body;

force imparting means disposed between said male and female bodies selectively operate to force said male body into said female body, said force imparting means com-



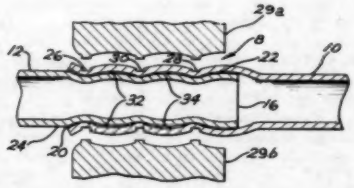
prising toggle joint said toggle joint including first and second toggle arms, each of said toggle arms having a free end, said toggle joint being movable between a first position in which said first and second arms are at a first angle to one another to a second position in which said first and second arms are at a second, larger angle to one another, and the free end of said first arm is in engagement with said internally formed bearing surface in said female body and the free end of said second arm is in engagement with said externally formed bearing surface on said male body.

4,371,199

CRIMPED TUBE JOINT

Gerald J. Kushner, Louisville, and Edward Raleigh, Fern Creek, both of Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 117,326, Jan. 31, 1980, Pat. No. 4,330,924.
This application Jul. 31, 1981, Ser. No. 288,962
Int. Cl.³ F16L *13/14*
U.S. Cl. 285—382.2 **2 Claims**



1. A tube joint comprising:

a first tube having an end portion dimensioned to receive the end portion of a second tube with radial clearance between the contiguous surfaces to be joined;

a first portion of the end portion of said second tube being coated with an ambient temperature curable adhesive;

a second portion of the end portion of said second tube in an area between said adhesive and the free end thereof is provided with a cured resilient sealer;

a plurality of grooves including a pair of axially spaced end grooves and a central groove intermediate said spaced end grooves being formed in the outer surface of a portion of the first tube that overlaps said second tube, the portion of said first tube which underlies said grooves extending radially inwardly a distance sufficient to reduce the diameter of said first tube and cause said first tube to grip said second tube to reduce to substantially zero thickness the sealer and adhesive beneath said grooves;

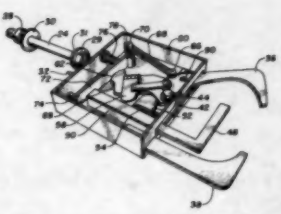
a first pocket located between one of said end grooves and said central groove for containing said sealer to form a first instant sealing area and a second pocket located between the other of said end groove and said central groove for containing said curable adhesive forming a second permanent sealing area after said adhesive has cured.

4,371,200

WIRE GATE LATCH

Thomas M. Porter, Halliday, N. Dak. 58636

Filed Jan. 16, 1981, Ser. No. 225,620
Int. Cl.³ E05C *3/12*
U.S. Cl. 292—99 **4 Claims**



1. A wire gate latch comprising:

a housing having a horizontal slot through one side thereof;

means for mounting said housing to a fixed post;

a first arm extending outwardly from said slotted side of the housing;

a second arm, pivotably mounted in said housing and extending outwardly through said slot, said second arm having a hooked end extending toward said first arm and further having a first position wherein said arms and housing side define an enclosure for engaging a post, and a second position pivotably displaced further from said first arm than said first position, whereby an opening is formed in said enclosure for receiving or releasing said post;

a slidable actuating bar within said enclosure extending into said housing;

first spring means associated with said actuating bar for urging said bar outwardly from said housing into said enclosure;

cam means within the housing associated with said actuating bar for moving said second arm from the second position to the first position when the actuating bar is partially depressed into the housing;

pawl means associated with a notch in the second arm for retaining the second arm in the first position, said pawl means in cooperative alignment with the actuating bar such that the actuating bar releases said pawl means from said notch when the bar is depressed further into the housing; and

second spring means associated with said second arm for urging the second arm toward the second position when said pawl means is released from said notch.

4,371,201

REVERSING RATCHET DOOR CLOSER

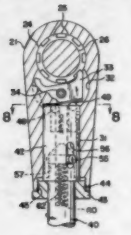
Arthur J. Stock, Lakewood, and Donald S. Christopher, Willowick, both of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Sep. 26, 1980, Ser. No. 190,962
Int. Cl.³ E05C *5/04*
U.S. Cl. 292—251 **5 Claims**

1. A reversing ratchet drive for turning a fastener selectively in clockwise and counterclockwise directions about a lever axis, comprising:

a lever supported for pivotal movement about said axis;

a housing defining a bore coaxial with said lever axis;
a drive head integral with said fastener received within said bore and having radial external ratchet teeth;
a double pawl pivotally mounted in said housing for movement between forward drive and reverse drive engagement with said external ratchet teeth and having an intermediate disengaged position;
said lever comprising a handle assembly having an inner end received in said housing for turning movement therein about a twist axis perpendicular to said lever axis, said

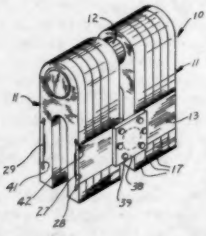


handle assembly being adapted to turn said housing about said lever axis;
means carried by said inner end of said handle assembly for moving said double pawl to its forward drive position when said handle assembly is twisted about its twist axis in one direction and to its reverse drive position when said handle assembly is turned about its twist axis in the opposite direction; and
means for biasing said handle to a neutral position between said two directions of twist wherein said pawl is in said disengaged position.

4,371,202
LAMINATED CLEVIS PIN

Timothy J. Freeman, 3772 River La., Rocky River, Ohio 44116; William J. Goler, 4186 W. 192 Ct., Country Club Hills, Ill. 60472, and Kenneth J. Humberstone, 3047 Lander Rd., Pepper Pike, Ohio 44124

Filed Dec. 22, 1980, Ser. No. 218,647
Int. Cl.³ B66C *1/34*; F16G *15/00*
U.S. Cl. 294—82 R **6 Claims**

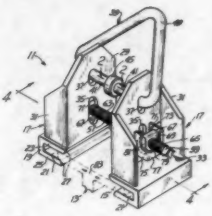


1. A clevis holding a pair of pins, away from their midlengths, in perpendicular planes, the clevis including a pair of apertured units being assembled on a first of said pins by receiving end portions of said first pin in their respective apertures, a pair of spaced spreader bars parallel to said first pin disposed on opposite sides of said units, said spreader bars each having an aperture aligned with that of the other and in the plane of the midlength of said first pin, a second pin having its end portions supported in said spreader bar apertures, said units and spreader bars being constructed and arranged in a manner whereby said pins when received in their respective apertures are sufficiently unobstructed at their midportions to receive a hook or like device for transmitting loads between said pins, said units each being formed by a plurality of separate laminations stacked in planes perpendicular to said first pin, said spreader bars engaging each of said laminations in a manner which permits loading on said pins to be distributed to each of said laminations.

4,371,203
UNIVERSAL BEAM CLAMP

Donald C. Munro, P.O. Box 389, Grand Blanc, Mich. 48439

Filed Jul. 13, 1981, Ser. No. 282,851
Int. Cl.³ B66C *1/64*
U.S. Cl. 294—86 R **9 Claims**



1. A universal beam clamp for supportably engaging the top flange of an I-beam comprising of a pair of opposed symmetrical clamp elements, each clamp element including an elongated base having an elongated inwardly opening top flange receiving slot along its inner edge;
an upright support plate mounted upon and secured to said base along said edge;
there being aligned upright elongated first and second slots centrally of said support plate;
an adjusting screw extending transversely of said support plates through said first slots, said screw having separate right and left hand threads and a polygonal wrench engaging end;
a pair of nuts mounted on each of said threads outwardly of said support plates;
a nut retainer on said support plate outwardly thereof receiving a nut retaining it against rotation;
rotation of said screw in one direction simultaneously drawing said clamp elements together for gripping the I-beam flange therebetween, rotation of said screw in the opposite direction separating said clamp elements;
and a clamp element support having a base projected through said second slots and an apex overlying said support plates adapted for connection to a crane operated lift hook.

4,371,204
PIVOTAL ROOF VENT PANEL APPARATUS

Richard D. George, Brownstown, and Gary L. Vanhulle, Woodhaven, both of Mich., assignors to Skytrends, Inc., Warren, Mich.

Filed Nov. 19, 1980, Ser. No. 208,146
Int. Cl.³ B60J *7/08*
U.S. Cl. 296—218 **11 Claims**

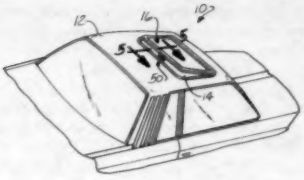
1. A pivotal roof vent apparatus for a vehicle having an opening in the roof thereof comprising:
a frame adapted to be secured around the periphery of said opening in the roof of said vehicle;
a roof vent panel pivotally connected at a front edge to said frame;
a latch connected to the rear edge of said roof vent panel, said latch being operative to move said roof vent panel between a first position wherein the rear edge of said roof vent panel extends above said roof opening and a second

position wherein said roof vent panel closes said roof opening, said latch comprising:

a first link connected to said rear edge of said roof vent panel;

a second link pivotally connected to said first link at a first end;

means, connected to the opposed end of said second link, for removably attaching said opposed end of said second link to said frame; and



means carried by said first and second links for releasably locking said latch in the first venting position, said locking means comprising:

an aperture formed in said second link;

a biased pin carried by said first link, said pin releasably engaging said aperture in said second linking when said latch is moved to said first venting position for releasably locking said latch in said first venting position and being urged against the biasing force to disengage from said aperture when said first link is urged from the extended venting position.

4,371,205

DOOR LOCK

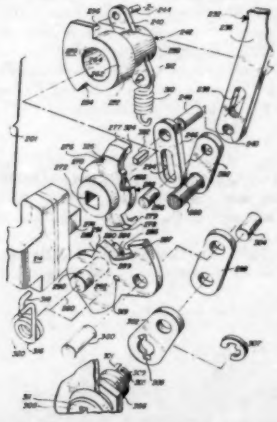
John R. Kaveney, Jr., East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00853, § 371 Date Jul. 7, 1980, § 102(e) Date Jul. 7, 1980

PCT Filed Jul. 7, 1980, Ser. No. 250,753

Int. Cl.³ E05C *3/06*

U.S. Cl. 292—48 **10 Claims**



1. A lock and linkage assembly for a door for a vehicle having a latch structure (204) for latching and locking said door, comprising first and second handle means (214,202) extending outwardly and inwardly from opposite sides of said door, said second handle means (202) being remote from the lock assembly and connected thereto by rod means (216,232), a cam element (282) rotatably mounted in said door, said cam element (282) having one portion (286) engaging with said first handle means (214) for preventing said first handle means (214) from being turned when said cam element (282) is in the locked position, a rotatable bellcrank (242) rotatably mounted in said door and operably connected to said rod means (216,232) and to said second handle means (202), said cam element (282) having a second portion (288) engaging with an abutment (254) on said rotatable bellcrank (242) when said cam element (282) is in said locked position, said second handle means (202) moving said rod means (216,232) and said rotatable bellcrank (242) to move said abutment (254) against said second portion (288) of the cam element (282) to move the first portion (286) of the cam element (282) out of engagement with the first handle means (214) and to move the cam element (282) to the unlocked position, said first and second handle means (214,202) are operative to unlatch the door when said cam element (282) is in the unlocked position.

4,371,206

ROCKABLE INFANT SEAT/CRADLE

Edward M. Johnson, Jr., Matteson, Ill., assignor to Kolcraft Products, Inc., Chicago, Ill.

Filed Feb. 17, 1981, Ser. No. 235,148

Int. Cl.³ A47C *1/02, 3/03;* A47D *13/10*

U.S. Cl. 297—183 **6 Claims**

1. A rockable infant seat/cradle comprising:

a body-receiving and supporting shell, said shell having an elongated bottom surface and opposed sidewalls, the lowermost edges of said sidewalls being curved along the length thereof to support said shell on an associated support surface while permitting rocking movement thereof relative to such surface;

generally U-shaped handle means having elongated leg portions rotatably secured to opposite sides of said shell;

gear means to effect manual rotation of said handle means to various positions relative to said shell, thereby to permit carrying said shell or to position said shell in rockable or various fixed positions relative to the underlying associated support surface; said gear means including a gear fixedly secured to the distal end of each leg portion of said handle, each said gear having a plurality of axially extending teeth; a gear-retaining ring affixed to the respective opposed sidewall of said shell, said retaining ring including a plurality of axially extending apertures therethrough, through which said gear teeth normally extend, thereby to lock said handle in a fixed position relative to said shell;

and means for normally biasing the respective gears and the handle legs to which said gears are secured in an engaged position wherein the gear teeth extend through the gear ring apertures, the gears being axially displaceable relative to said gear-retaining rings to space the distal ends of said gear teeth axially of the gear ring apertures whereby the handle may be rotated about the axes thereof to permit selective rotatable movement of said handle means relative to said shell.

4,371,207

POSITION ADJUSTER FOR MOTOR VEHICLE SEATS AND WINDOWS

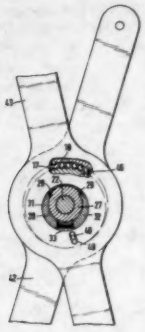
Hans Wilking, Rothselberg, and Egon Kafitz, Hochspeyer, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,342

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013304

Int. Cl.³ A47C *1/025;* F16H *55/18*

U.S. Cl. 297—348 14 Claims



1. A position adjuster for seats and/or windows, particularly in motor vehicles, comprising two mount levers, a rotary shaft for interconnecting said levers, an inner gear connected to one lever and a spur gear ring connected to the other lever and being in mesh with said inner gear, the crown circle of said spur gear ring being smaller at least about one tooth than the root circle of said inner gear, an eccentric arranged for joint rotation with said shaft and supporting one of said gears to impart a wobbling movement thereto, said eccentric including a carrier disk connected to said rotary shaft, a pair of wedge-like segments supported one after the other for movement on a major portion of the circumference of said carrier disk, and a resilient pressure means arranged between said segments to urge the same one from the other into a locking position in which radial play between the assigned gear and said carrier disk is eliminated, whereby during the rotation of said shaft said segments are displaced towards each other against said pressure means to permit a radial play between said gear and said carrier disk.

4,371,208

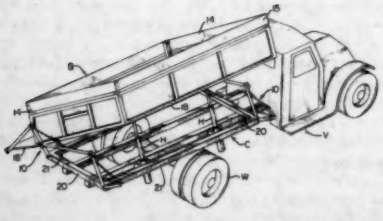
GATE PANEL OPERATOR FOR SIDE DUMPING VEHICLES

Stanley S. Stricker, 915 K St., Gering, Nebr. 69341

Filed Apr. 13, 1981, Ser. No. 253,199

Int. Cl.³ B60P *1/04*

U.S. Cl. 298—23 D 15 Claims



1. In a side dumping vehicle wherein a dump box is supported on a frame of the vehicle, said dump box having opposite side and end panels, one of said side panels pivotally mounted about its lower end for swinging movement between an open and closed position when said dump box is advanced between an inclined dumping position and a level position, respectively, the combination therewith of a panel operator disposed at least at one end of said dump box extending substantially at right angles to said one side panel comprising:

first and second lever arm members pivotally connected to said frame in spaced-apart relation to one another for upward extension therefrom;

limit stop means associated with one of said lever arms;

pivotal connecting means pivotally interconnecting said first and second lever arms in spaced relation above their points of pivotal connection to said frame; and

a connector arm pivotally interconnecting one of said first and second lever arm members to the upper end of said one side panel whereby tilting movement of said dump box is operative to initiate pivotal movement of said first and second lever arm members while permitting upward movement of said limit stop means, said lever arm members being so constructed and arranged that the relative velocity of said one lever arm member interconnected to said side panel is greater than that of the other of said first and second lever arm members to advance said side panel into the open position independently of the side pressure exerted by the load carried in said dump box.

9. A dump vehicle wherein a dump box is supported on a frame of said vehicle and has opposite side and end panels, one of said panels pivotally mounted about its lower end for swinging movement between an open and closed position when said dump box is advanced between an elevated dumping position and a lowered level position, respectively, a linkage mechanism extending substantially at right angles to said pivotally mounted panel comprising:

a bell crank pivotally connected to said frame having a first laterally extending control arm provided with limit stop means engageable by the underside of said dump box and an upwardly extending lever arm movable independently of said dump box when said dump box is elevated; and

motion amplifying means pivotally connected to said frame in laterally spaced relation to said bell crank including means pivotally interconnecting said bell crank and said motion amplifying means and a connector arm pivotaliy interconnecting said motion amplifying means to the upper end of said panel, said motion amplifying means being operative to accelerate movement of said hinged panel relative to tilting movement of said dump box and pivotal movement of said bell crank so as to positively open said hinged panel independently of side pressure exerted by the load in said dump box.

4,371,209

MINING MACHINE STEERING EQUIPMENT

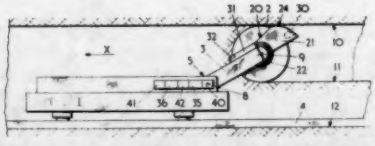
Derek Alford, and Alan Wilkinson, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 22, 1980, Ser. No. 219,193

Claims priority, application United Kingdom, Feb. 1, 1980, 8003503

Int. Cl.³ E21C *35/10, 35/24*

U.S. Cl. 299—1 27 Claims



1. Mining machine steering equipment for use with a mining

machine including a cutter drum or head mounted on a ranging arm for movement between two operational positions, comprising a component having two operational modes associated with the two operational positions of the cutter drum or head, respectively, actuator means for urging the component into one or other of the two operational modes, and sensor means for sensing the angular position of the component with respect to the arm and for deriving a signal indicative of the sensed angular position of the component.

4,371,210

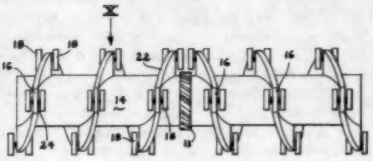
FREELY ROTATABLE PICK BIT HOLDER ON ROTARY DRIVEN MEMBER AND METHOD

Donald L. Leibee, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 61,190, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 894,736, Apr. 10, 1978, abandoned. This application Jun. 2, 1981, Ser. No. 269,553

Int. Cl.³ E21C *27/24, 35/18*

U.S. Cl. 299—10 **9 Claims**



1. A method of reducing coal formations utilizing elongate pick type mining bits having an attack point at one end, wherein said method comprises the steps of: mounting in a readily releasable manner said pick type mining bits on the periphery of a support member which is freely rotatable through 360 degrees about an axis; inclining said bits toward a first direction of rotation with respect to said axis; and translating said releasably mounted bits across the formation to be reduced in a direction transverse to said axis; impacting the formation with said bits, thereby causing a frictional force to act upon said bits; and then rotating due to said frictional force said freely rotatable support member in a second direction of rotation about said axis opposite to said first direction of rotation.

4,371,211

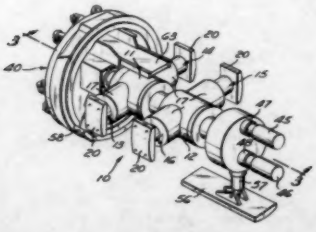
TUNNEL BORING MACHINE AND METHOD OF OPERATING SAME

Larry L. Snyder, Twinsburg, Ohio, assignor to Jarva, Inc., Solon, Ohio

Filed Dec. 11, 1980, Ser. No. 215,221

Int. Cl.³ E21D *9/10*

U.S. Cl. 299—11 **7 Claims**



7. The method of advancing a tunneling machine along a tunnel bore, said tunneling machine having a main frame supporting a cutter head rotatable about an axis parallel to the tunnel axis and a pair of support frames each adapted to independently and selectively grip the tunnel wall and mounted for movement along the tunnel axis independently of the main frame and each other, comprising the steps of:

(1) causing one support frame to grip the tunnel wall while applying thrust between said one support frame and said main frame,

(2) after said cutter head has advanced a given distance causing said other support frame to grip the tunnel wall and applying thrust between said other support frame and said main frame,

(3) thereafter releasing said one support frame from the tunnel wall and advancing it along said main frame towards said cutter head,

(4) after said cutter head has advanced a given distance causing said one support frame to grip the tunnel wall and applying thrust between said one support frame and said main frame,

(5) reducing the thrust between each support frame and the main frame in half when thrust is applied between both support frames and said main frame simultaneously, whereby the thrust of said cutter head along said tunnel axis remains substantially constant through steps (1) through (6), and

(6) thereafter releasing said other support frame from the tunnel wall and advancing it along said main frame towards said cutter head,

whereby said cutter head is continuously advanced along the tunnel axis during steps (1) through (6).

4,371,212

WHEEL RIM BOLT ATTACHMENT

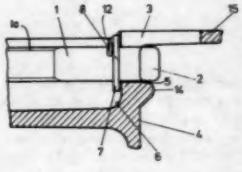
Jakob Rohr, Schaffhausen, Switzerland, assignor to George Fischer Aktiengesellschaft, Switzerland

Filed May 8, 1980, Ser. No. 148,165

Claims priority, application Switzerland, Sep. 5, 1979, 4343/79

Int. Cl.³ B60B *23/10*

U.S. Cl. 301—9 DN **5 Claims**



1. An improved apparatus for attaching a wheel rim to a wheel body on a vehicle, such as a truck or bus, the wheel body being of the type having a plurality of support means around the periphery of the wheel body, each support means including a first wall lying in a plane substantially perpendicular to the wheel axis, a second wall extending perpendicularly from said first wall, and means defining a continuous, generally L-shaped slot extending into both of said walls, the apparatus including a T-head bolt, said slot being dimensioned to permit passage of the smaller dimension of the T-head therethrough but to prevent passage of the larger dimension of the head, so that the head can be inserted through the slot and rotated 90° to bring the bottom surfaces of the head into contact with the inner sides of the first wall on both sides of the slot, the improvement comprising

a washer;

said first wall including means defining a first shoulder on one side of the slot and a second shoulder on the other side of said slot, said shoulders being adjacent the juncture of said first and second walls and engagable with said washer for positioning thereof and being spaced apart by a dis-

tance less than the outer diameter of said washer, the height of said first shoulder being greater than the thickness of said washer and the height of said second shoulder being less than the thickness of said washer;

said bolt including means defining a diametral hole through said bolt spaced from the bottom surfaces of said head by a distance substantially equal to the combined thicknesses of said first wall and said second shoulder, the axis of said hole being angularly offset from the longer dimensions of said head; and

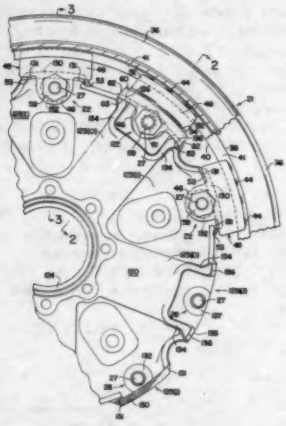
fastener means insertable through said hole for preventing said washer from moving axially along said bolt away from said first wall.

4,371,213

EDGE LUGGED TIRE CARRYING RIM AND WHEEL

William D. Walther, Kettering, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Filed May 9, 1977, Ser. No. 795,063
Int. Cl.³ B60B *23/10*
U.S. Cl. 301—12 R **2 Claims**



1. A combination of dual inner and outer tire carrying rims mounted on a vehicle wheel, said outer rim being seated and locked on said rim by fastening assemblies,

said wheel having a plurality of inner and outer spoke members, each said outer spoke member having a felloe comprising spaced-apart axially projecting wing portions providing for outwardly facing axially inner and axially outer pairs of dual axially oriented surfaces and a radially directed surface extending inwardly between said dual axially oriented surfaces substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an axially projecting component of said fastening assemblies,

said outer rim having a rim base edge portion comprising a radially inclined axially inner surface and an adjacent axially outer surface, said rim base edge portion having a plurality of radially inwardly projecting clamp lugs intergrally secured thereto,

each said clamp lug being generally T-shaped and having a radially outer curved body portion with a radially outer face comprising a radially inclined axially inner surface and an adjacent axially outer surface, said radially inclined and axially outer clamp lug face surfaces being in mating engagement with said radially inclined and axially outer rim base edge portion surfaces when each said clamp lug is integrally secured to said rim base edge portion,

each said clamp lug further having a radially inwardly directed leg portion extending inwardly from said curved body portion and defining the plane of a substantially continuous axially facing surface oriented substantially perpendicular to the rotational axis of said rim and having a bore therein for receiving said axially projecting component of said fastening assemblies,

each said curved body portion further having lateral wing portions providing downwardly facing dual axially oriented surfaces,

each said curved body portion still further having a radially inner face adjacent said leg portion and comprising a radially inclined axially inner surface intersecting an axially directed transitional surface terminating at said leg portion,

each said fastening assembly comprising said axially projecting component and a clamp element supported thereon, each said clamp element having lateral wing portions providing downwardly facing dual axially oriented surfaces, an axially inwardly directed member and a radially outer portion with a radially inclined surface,

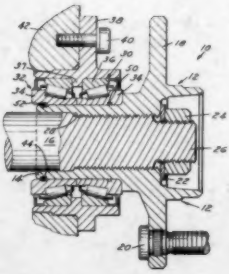
whereby, said outer rim is seated on, and therafter locked on, said wheel by initial and final tightening of said fastening assemblies, said initial tightening of said fastening assemblies with said axially inwardly directed clamp element members in mating engagement with said clamp lug leg portions and said dual axially oriented surfaces on said lateral wing clamp element portions in mating engagement with said axially outer pair of dual wheel felloe surfaces and said dual axially oriented surfaces on said lateral wing clamp lug portons in radially registered engagement with said axially inner pair of dual wheel felloe surfaces, seating said radially inclined clamp lug body portions in concentric registry with said radially inclined clamp element surfaces; said final tightening of said fastening assemblies to apply a load for axial movement of said clamp lug leg portions locking said outer rim on said wheel by the full surface engagement of said substantially continuous axially facing surfaces on said clamp lug leg portions with said radially directed wheel felloe surfaces and the elastic deformation of said clamp lugs and said rim base edge portion relative to said substantially perpendicular plane of said radially directed wheel felloe surfaces.

4,371,214

BEARING HUB AND CARRIER ASSEMBLY FOR A DRIVEN STEERING WHEEL UNIT

Don S. Strader, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Nov. 17, 1980, Ser. No. 207,349
Int. Cl.³ B60B *35/18*
U.S. Cl. 301—126 **6 Claims**



1. For use in a driven steering wheel unit as in a front wheel drive vehicle, a bearing hub and carrier assembly comprising a hub including an internally splined spindle adapted to receive a splined drive shaft and an integral flange radiating from one end of said spindle for mounting of a vehicle wheel, at least one bearing means having an inner race telescopically received

over said spindle and an outer race, a cup carrier mounted to said outer race externally of said spindle for mounting said assembly to a vehicle and means for locking said hub against axial removal with respect to said bearing means and said cup carrier, said locking means comprising a first circumferential groove formed on said spindle adjacent the flange-remote end thereof, a second circumferential groove formed in said inner race in radial alignment with said first circumferential groove, a third groove on said spindle at an intersecting acute angle with respect to said first groove and opening at said flange-remote end of said spindle, a fourth groove formed in the outer spindle surface at an angle intersecting said third groove at said flange-remote end of said spindle, and a one-piece retaining wire received in said aligned first and second grooves surrounding said spindle for preventing axial displacement of said first and second grooves out of radial registry, an end of said wire extending through said third groove which functions as a wire feed groove and then into said fourth groove which functions as a locking groove for locking said wire against rotation with respect to said spindle and affording access to said wire at the intersection of said feed and locking grooves for removing said wire in disassembly.

4,371,215

DUAL TYPE HYDRAULIC CIRCUIT IN A VEHICLE BRAKE SYSTEM

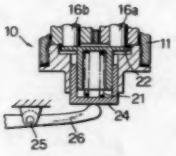
Hiroshi Kawaguchi, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 961,603, Nov. 17, 1978, abandoned. This application Dec. 31, 1980, Ser. No. 221,569

Claims priority, application Japan, Nov. 17, 1977, 52-138334

Int. Cl.³ B60T *8/18*

U.S. Cl. 303—22 R **4 Claims**



1. A dual type hydraulic circuit for a vehicle brake system including (1) a dual master cylinder building up hydraulic braking pressure relative to the degree of depression of a brake pedal; (2) at least one wheel cylinder disposed at each of the right and left rear road wheels of the vehicle; (3) two mutually independent hydraulic piping systems which connect said dual master cylinder to said rear wheel cylinders; and (4) valve means incorporated in said two piping systems, said valve means comprising:

(a) a housing having two mutually independent fluid passages therein each of which constitutes a portion of said two hydraulic piping systems respectively;

(b) two valve seats formed one within each respective one of said one fluid passages;

(c) two valve pistons each having a valve poppet adapted to contact said corresponding valve seat, and being axially movable for bringing said valve poppet thereof onto and off of said corresponding valve seat, said valve pistons being disposed in parallel to one another and both being exposed at respective one ends thereof to an air chamber formed within said housing, with a result that, as long as said valve poppets are held in contact with said valve seats, the pressure-receiving areas of said valve pistons exposed to a portion of said fluid passages in communication with said rear wheel cylinders are greater than those of said valve pistons exposed to another portion of said passages in communication with said master cylinder;

(d) a compression spring urging said two pistons away from said air chamber;

(e) transmission means interposed between said two valve pistons and said spring for transmitting the resilient force of said spring to said two valve pistons to make them operate together and, upon rising of the hydraulic pressure in said master cylinder beyond a predetermined upper limit, the hydraulic braking pressure in said rear wheel cylinders being controlled to rise at a lower gradient than the hydraulic pressure in said master cylinder, said transmission means including a first portion disposed within said housing and slidable in parallel with a line of movement of said two valve pistons to cause the resilient force of said spring to act in parallel with said line and further including a second portion fixed to said first portion, which second portion is a plate-like configuration and is in contact with one end of said spring at the middle thereof to receive the resilient force of said spring, and in contact with said two pistons at opposite end portions thereof to evenly deliver said resilient force to said two pistons at said opposite end portions thereof; said end portions of said second portion extending outwardly of said first portion of said transmission means;

(f) said first portion of said transmission means comprising a hollow cylindrical member;

(g) a movable seat member, means to mount said movable seat member in contact with the other end of said spring and so as to permit said seat member to move substantially in parallel with said line of movement of said transmission means,

(h) said movable seat member comprising a bottom and a hollow cylindrical member, said movable seat cylindrical member being slidably mounted on the outside of and telescopically fitted to said transmission means first portion;

(i) said movable seat member bottom and said transmission means first portion defining a space in which said compression spring is housed; and

(j) means to move said movable seat member in response to variations of the load applied to said rear wheels;

whereby the axial movements of said valve pistons are controlled in accordance with the varying magnitude of the load applied to said rear wheels.

4,371,216

FLUID BEARING

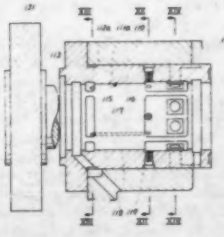
Hiroshi Suzuki, Okazaki; Kunio Shibata, Kariya, and Kazuhiko Sugita, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 53,038, Jun. 28, 1979, Pat. No. 4,285,551. This application Dec. 5, 1980, Ser. No. 213,213

Claims priority, application Japan, Jul. 3, 1978, 53-80696; Jul. 3, 1978, 53-80697; Jul. 24, 1978, 53-90098; Aug. 2, 1978, 53-94427; Dec. 27, 1978, 53-161527; Dec. 27, 1978, 53-161528

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—118 **2 Claims**



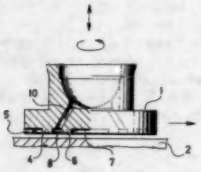
1. A fluid bearing for rotatably supporting a rotary shaft comprising:

a stationary housing;
a pair of bearing members fixedly and coaxially inserted in said housing from the opposite ends thereof, each bearing member having an internal bore which forms a bearing surface;
a plurality of pressure generating zones defined on each of said bearing surfaces in a circumferential direction;
a pair of axially spaced fluid pockets in each of said pressure generating zones, an axial width of one of said pair of fluid pockets which is located remote from the axially inner end of each bearing member being smaller than that of the other fluid pocket located near the inner end of each bearing member;
at least one raised land formed in at least one of said pair of fluid pockets in each of said pressure generating zones;
passage means for fluidically communicating said pair of fluid pockets with each other;
throttle means connected to said fluid pockets for admitting pressurized fluid in the same;
an exhaust port formed on said raised land for discharging pressurized fluid; and
exhaust means formed on each of said bearing surfaces outside said pressure generating zones for discharging pressurized fluid.

4,371,217
HYDROSTATIC SLIDING ELEMENT

Jozef Turza; Ondrej Kilik, and Jan Rusnak, all of Nova Dubnica, Czechoslovakia, assignors to Zavody tazkeho strojarstva, narodni podnik, Dubnica nad Vahom, Czechoslovakia

Filed Jun. 17, 1981, Ser. No. 274,412
Claims priority, application Czechoslovakia, Jun. 30, 1980, 4644-80
Int. Cl.³ F16C *17/00*
U.S. Cl. 308—5 R **3 Claims**



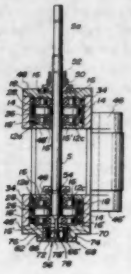
1. A hydrostatic sliding element consisting of a body, the sliding surface of which is formed by a packing ring, on a circumference of which there is disposed an auxiliary ring provided with intermittent grooves, the auxiliary ring being separated from the packing ring by means of a groove, a correction ring with a central correction recess, the correction ring being separated from the packing ring by a circular groove connected to inlets of pressure liquid.

4,371,218
BEARING MECHANISM

Michihiro Ichikawa, Kiryu, Japan, assignor to Ichikawa Iron Works Co., Ltd., Kiryu, Japan

Filed Dec. 29, 1980, Ser. No. 220,983
Claims priority, application Japan, Dec. 26, 1979, 54-180860
Int. Cl.³ F16C *39/06*
U.S. Cl. 308—10 **14 Claims**

1. A bearing mechanism for supporting an elongated rotary member having a center axis therethrough and rotatable about the center, the rotary member having at least one journal portion and at least one axial end portion, comprising a stationary support structure, at least one journal bearing assembly supported on said stationary support structure and engaging said journal portion for being operative to carry radial load from said rotary member, and a non-contact, magnetic thrust bearing unit which is stationary with respect to said support structure and which is positioned adjacent said axial end portion of said rotary member, said thrust bearing unit comprising a cylindrical member having an axial bore therein and positioned in substantially coaxially encircling relationship to said



axial end portion of the rotary member, only one of said cylindrical member and said end portion of said rotary member being constructed of a magnet.

4,371,219
FLOATING BUSH AND OUTER BEARING STRUCTURE FOR MOUNTING A SHAFT IN A BODY ROTATABLY

Ken Yamane, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Continuation of Ser. No. 72,899, Sep. 6, 1979, abandoned. This application Feb. 3, 1981, Ser. No. 231,017
Claims priority, application Japan, Nov. 14, 1978, 53-140248
Int. Cl.³ F16C *33/66*
U.S. Cl. 384—291 **4 Claims**

1. A bearing structure which supports a rotating shaft in a body, said body being formed with a lubricant-conducting passage which supplies lubricant comprising:
a floating hollow-cylindrical bush supported loosely on the shaft with a clearance existing therebetween; and
a hollow-cylindrical bearing held in the body with a clearance existing therebetween, said clearance between said body and said bearing communicating with said lubricant-conducting passage so as to receive lubricant therefrom, said bearing loosely supporting the bush with a clearance existing therebetween;
the bush being free in use to turn with respect to the bearing and the shaft;
the bush being formed with an even number n of circumferentially equally spaced passages extending radially from its outer cylindrical surface to its inner cylindrical surface,
the bearing being formed with a lesser even number m of circumferentially equally spaced passages which extend from its outer cylindrical surface to its inner cylindrical surface and which are inclined with respect to the bearing radii in the direction opposite to the normal direction of rotation of the shaft, whereby the passages of the bush are arranged to come into register sequentially with the passages of the bearing as the bush rotates relative to the bearing.

the radial angle subtended by the inner ends of the passages in the bearing being approximately 360°/m-360°/n.

4,371,220

SELF-LUBRICATING PLAIN BEARING

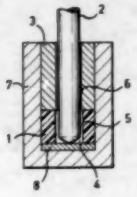
Egon Brucher, Hebelstrasse 57, D-7633 Seelbach, Fed. Rep. of Germany

Filed Jan. 13, 1981, Ser. No. 224,845

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001115

Int. Cl.³ F16C *33/82*; F16N *15/00*

U.S. Cl. 384—371 **13 Claims**



1. A self-lubricating plain bearing for a shaft, comprising a bore for receiving the shaft; a porous member which is arranged in the bore at an inner portion thereof and which occupies only a part of the bore in the axial direction thereof, the porous member being adapted to be impregnated with lubricant and surround the shaft at a clearance therefrom; and a bearing surface means adapted to support the shaft, which is disposed in the bore adjacent to the porous member and which extends outwardly therefrom, the bearing surface means having a bearing clearance from the shaft therein, the clearance between the shaft and the porous member being larger than the bearing clearance between the shaft and the bearing surface means, and the pore size of the porous member being larger than said clearance between the shaft and the porous member, whereby lubricant in the porous member flows by capillary action out of the clearance between the porous member and the shaft into the bearing clearance between the shaft and the bearing surface means.

4,371,221

COMPOSITE MODULAR ELEMENT STRUCTURE FOR FURNISHINGS

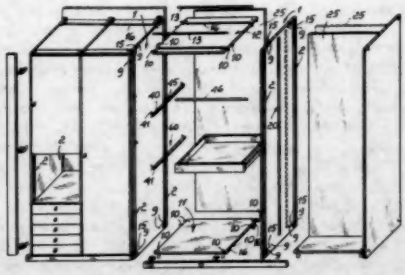
Camillo Citterio, Via Don Minzoni, 6 Robbiano di Giussano, Province of Milan, Italy

Filed Jul. 6, 1979, Ser. No. 55,927

Claims priority, application Italy, Feb. 2, 1979, 20680/79[U]

Int. Cl.³ A47B *53/00, 87/00*

U.S. Cl. 312—199 **8 Claims**



1. A composite modular element structure for furnishings, comprising a pair of spaced apart parallel vertical opposite side wall members, each including a pair of opposite vertical edge portions, each having a longitudinal groove extending parallel thereto and having a groove bottom and a pair of opposite groove flanks, a vertical back wall member connecting the opposite side wall members, vertical guideway-like means for the connection of said back and accessory elements and located in said longitudinal groove at each vertical edge portion of said side wall members, a roof panel and base panel adapted for assembling to said side wall members, tie members for assembling said side wall members and roof panel and base panel together, said tie members being carried by said side wall members and extending substantially perpendicular to said side wall members, wherein according to the improvement each sectional member comprises at least one web formation including supporting portions thereof and extending along said groove and facing said groove bottom and at least two spaced flange formations including engaging portions thereof and having lateral longitudinal edges and extending along said groove and facing said groove flanks and arranged tranverse to said web formation connecting said flange formations, each flange formation having rib formations at the outside surface thereof for engagement with said flanks of said grooves, said web formations having at least one supporting portion inwardly offset with respect to said lateral edges of said flange formations thereby said supporting portion of said web formation being arranged at a distance from said groove bottom to provide an anchoring interspace thereon when the sectional member is inserted in said groove, a series of through slots in said supporting portion and arranged at regular intervals over the longitudinal extension of said supporting portion of said web formations, and wherein said accessory elements have anchoring lug formations partially insertable selectively into said through slots and including an end portion thereof, which in the inserted position of said lug formation extends selectively into said anchoring interspace.

4,371,222

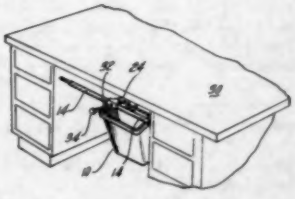
RETRACTABLE SCISSORS TONG MECHANISM

Mitchell F. Gorkiewicz, 419 E. Sixth St., Royal Oak, Mich. 48067

Filed Sep. 8, 1980, Ser. No. 185,339

Int. Cl.³ A47G *29/00*

U.S. Cl. 312—211 **11 Claims**



11. An apparatus for moving a container between the front and rear of a housing, said apparatus comprising:

a guide rail extending from the front to the rear of the housing;

means for mounting said rail in the housing;

means for supporting a container on said rail, said supporting means being movable between the front and rear of the housing;

an actuating member connected to said rail and movable therealong;

trivet means having a plurality of expansible sections, said trivet means fastened to said rail, said actuating member, and said supporting means for moving said supporting means a greater axial distance along said guide rail than the distance moved by said actuating member, whereby a container attached to said supporting means may be moved from the rear to the front of the housing by moving

said actuating member only a portion of the distance therebetween;

wherein said rail is hollow and has an axial slot near the rear of the housing and wherein said actuating member comprises:

a rod coaxially slidably disposed in said rail;

a pin connecting said rod and the first section of said trivet mechanism so as to support said trivet mechanism, said pin being slidable through said slot so as to expand and contract said first section by movement of said rod.

4,371,223

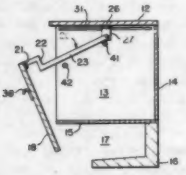
CABINET DOOR HINGE

Hans C. Grunert, Aldelberg, and Heinz Becker, Weinstadt, both of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed May 14, 1980, Ser. No. 149,572

Int. Cl.³ A47B *95/00;* **E05D** *15/58*

U.S. Cl. 312—325 **4 Claims**



1. In a cabinet comprising top, bottom, side and rear walls and an open front, the bottom being supported above a floor surface so as to provide an open space beneath the bottom wall and a door for closing the open front, an improved hinge system for moving the door between a closed and an open position wherein the door in its open position is stored in the open space beneath the cabinet bottom wall, said hinge system comprising:

(a) horizontal runners along each side wall adjacent the top thereof and extending substantially front to rear in said cabinet;

(b) a slide supported in said runners, said slide being adjacent said back wall when said door is in its closed position and adjacent the front of said cabinet when said door is in its full open position;

(c) a hinge bar having a first end pivotally connected to said slide and a second end fixed to said door adjacent the top thereof, said hinge bar extending substantially horizontally from said slide when said door is in its closed position and depending substantially vertically from said slide when said door is in its open position; and

(d) support means fixed to said side walls and providing substantially the sole support to maintain said hinge bar in a substantially horizontal orientation and said door in a closed position, said means being located at a point intermediate the ends of said hinge bar so as to become inoperative to support said bar in a horizontal orientation when said slide and the first end of said hinge bar are moved toward the open front of said cabinet and pass forward of said support means, thereby allowing said hinge bar to pivot downwardly to a substantially vertical position.

4,371,224

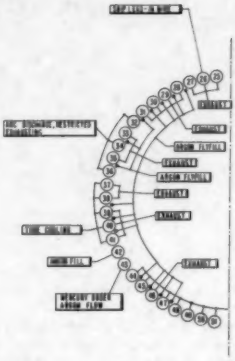
SINGLE TURRET MACHINE FOR FABRICATING HIGH-INTENSITY DISCHARGE ARC TUBES

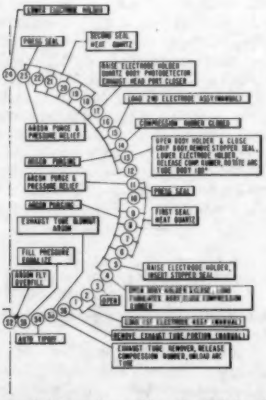
John J. Murphy, Livingston; John Petro, Belleville, and Melvin C. Unglert, Wyckoff, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1980, Ser. No. 219,695

Int. Cl.³ H01J *9/32, 9/48*

U.S. Cl. 316—32 **1 Claim**





1. A high-speed integral machine for fabricating substantially contaminant-free high-intensity discharge arc tubes, said machine comprising rotary lamp-making means comprising a turret, a plurality of arc tube body holding members each mounted on and about the peripheral portion of said turret, a plurality of work station means located about the periphery of said turret, driving means for driving said turret and indexing each of said plurality of arc tube holding members in a stop-and-go fashion so that each of said plurality of arc tube holding members is sequentially indexed from work station means to work station means, said arc tubes as fabricated each including a tubular quartz body having a first electrode assembly press-sealed at one end thereof and a second electrode assembly press-sealed at the other end thereof, said electrode assemblies each comprising an electrode affixed to one end of a ribbon-type metallic seal means, a predetermined discharge-sustaining filling being contained within said arc tube body as fabricated, said arc tube body during fabrication having an exhaust tubulation projecting laterally therefrom and opening into the interior thereof, said machine operating to receive each arc tube

individually and to separately fabricate same, said machine comprising:

(a) a first of said work station means operating to load each said first electrode assembly and said arc tube body onto one of said arc tube body holding members;

(b) a second of said work station means for heating one end of said loaded arc tube body and inserting said first electrode assembly and press-sealing said heated end of said loaded arc tube body to rigidly secure said first electrode assembly and seal said heated end of said loaded arc tube body while purging said arc tube body with an inert gas;

(c) a third of said work station means operating to heat the other end of said loaded arc tube body and insert said second electrode assembly and press-seal heated other end of said arc tube body to rigidly secure said second electrode assembly and seal said other end of said arc tube body while purging said arc tube body with an inert gas;

(d) a fourth of said work station means operating to exhaust said arc tube body while still hot;

(e) a fifth of said work station means for repeatedly filling said arc tube with an inert gas and creating an arc discharge between said electrodes and exhausting said arc tube body to substantially remove any contaminants;

(f) a sixth of said work station means for partially cooling said arc tube body while exhausting same and filling said arc tube body with an inert gas;

(g) a seventh of said work station means for dosing said arc tube body with a predetermined amount of mercury and repeatedly filling said arc tube body with an inert gas and then exhausting said inert gas;

(h) an eighth of said work station means for overfilling said arc tube body with an inert gas to a pressure greater than the final desired fill pressure, and then bleeding said inert gas from said overfilled arc tube body to achieve said final desired fill pressure;

(i) a ninth and final of said work station means for tipping-off said exhaust tubulation from said arc tube body and removing the residual tip from said arc tube body holding member and unloading said completed arc tube from said arc tube body holding member, whereby all fabricating operations are completed upon one turret without substantial cooling of said arc tube between fabricating steps and a possible introduction of impurities therein.

4,371,225

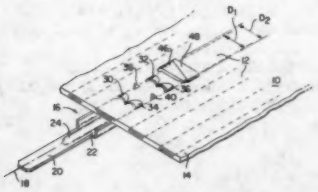
ELECTRICAL CONNECTOR FOR TERMINATING FLAT MULTICONDUCTOR CABLE

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jul. 31, 1980, Ser. No. 174,234

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—97 C **12 Claims**



1. An electrical connector for terminating flat cable having elongate conductors each of predetermined lateral expanse disposed within an insulative casing, said connector comprising

an electrically conductive elongate member having a web portion and a terminal portion, said web portion defining first and second laterally opposed side margins spaced apart a distance not greater than said predetermined conductor expanse and a further side margin laterally outward of one of said first and second side margins, first and second insulation-piercing and conductor-penetrating teeth extending respectively from said web portion at said first and second side margins and an insulation-piercing tooth extending from said web portion at said further side margin.

4,371,226

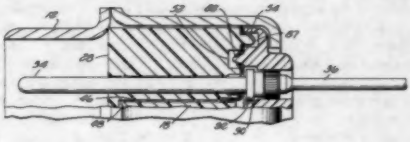
FILTER CONNECTOR AND METHOD OF ASSEMBLY THEREOF

Salvatore T. Brancaleone, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,295

Int. Cl.³ H01R *23/08*

U.S. Cl. 339—147 R **14 Claims**



1. A filter connector comprising:

an insulator body having at least one row of cavities therein, each said cavity receiving an electrical contact;

a slot in said body parallel to said row of cavities;

a monolithic capacitor in said slot;

said capacitor comprising a dielectric substrate having a plurality of parallel, spaced live electrodes on an outer face thereof facing in the direction of said contacts and aligned therewith;

an individual, separate conductive spring element associated with each of said contact cavities making resilient electrical connection between the contact therein and a corresponding live electrode of said capacitor; and

a conductive carrier strip for said spring elements mounted on said insulator body and separated from said spring elements.

4,371,227

ELECTRIC CONNECTOR

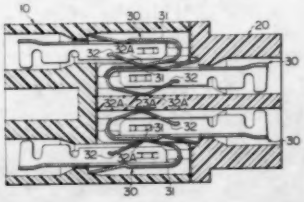
Yosikazu Yosimura, Ohsaki, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1980, Ser. No. 178,006

Claims priority, application Japan, Apr. 19, 1979, 54-53822[U]

Int. Cl.³ H01R *13/05, 13/432*

U.S. Cl. 339—211 **2 Claims**



1. An electric connector comprising a pair of mating parts adapted to be coupled to each other, and contact elements disposed in the housings of said mating parts having same shape and dimensions, each of said contact elements having a

main body in the form of a channel and a plate-like member upwardly and rearwardly extending from the forward end of the bottom wall of said main body, the rearward end of said main body forming a connecting section for an electric wire to be terminated, the outer surface of the forward portion of the bottom wall of said main body forming a planar contacting section, a portion of the bottom wall of the channel-shaped main body between the connecting section and the planar contacting section being cut and pushed out to provide a latching tongue, the side walls of the portion of the channel-shaped main body the bottom wall of which forms the planar contacting section being provided with latching protrusions outwardly embossed, said plate-like member being provided with an upwardly convex spring contact, the contact element being inserted into a contact element groove of the housing of one of said mating parts so that said planar contacting section of the contact element is exposed to the exterior of the groove and said convex spring contact of the contact element faces to the bottom wall of the groove, the latching tongue engaging a latching protrusion of said one housing and the outwardly embossed latching protrusions of said connector element engaging the inner wall of the contact element groove thereby fixing the contact element in place in the contact element groove and substantially resisting angular movement of said planar contacting section relative to the housing, the contact element being inserted into a contact element groove of the housing of the other mating part so that said convex spring contact of the contact element is exposed to the exterior of the groove, the latching tongue engaging a latching protrusion of said other housing and the outwardly embossed latching protrusions of said connector element engaging the inner wall of the contact element groove thereby fixing the contact element in place in the contact element groove and substantially resisting angular movement of said planar contacting section relative to said housing, whereby said outwardly convex spring contact of the contact element in the other mating part can make contact with said planar contacting section of the contact element in the one mating part and the convex spring contact of the contact element in said one mating part makes press contact with the bottom wall of the contact element groove in the housing of said one mating part, when said mating parts are coupled to each other.

4,371,228

ELECTRIC CONNECTOR

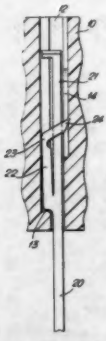
Walter M. Chalmers, 12 Clive Rd., Dundee, Scotland

Continuation-in-part of Ser. No. 78,208, Sep. 24, 1979, abandoned. This application Sep. 11, 1980, Ser. No. 186,385

Claims priority, application United Kingdom, Sep. 27, 1978, 38273/78

Int. Cl.³ H01R *13/42*

U.S. Cl. 339—221 R **6 Claims**



1. An electric connector of the type comprising a housing of electrically insulating material having a plurality of contact members extending parallel to one another and arranged to be inserted and withdrawn from the housing from one end thereof, in which the housing includes, for each contact member, an aperture extending through the housing and defining a retaining shoulder, a contact-locating region, and a slot communicating with the contact-locating region and extending from the said one end of the housing for at least part of the length of that region, and in which contact member includes a terminal portion arranged to project from the end of the housing remote from the said one end, a contact portion arranged to be located in the contact-locating region so as to cooperate with a plug member inserted into the housing from said one end, and a retaining portion having a sharpened end arranged to extend into said slot and shaped so as to become wedged across the aperture to prevent the withdrawal of the contact member through the said one end of the housing.

4,371,229

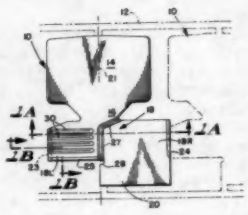
INTEGRAL ELECTRICAL CONNECTOR AND METHOD FOR MAKING SAME

Paul J. Spangler, Novelty, and Robert C. Kosio, Mentor, both of Ohio, assignors to ETC, Incorporated, Bedford Heights, Ohio

Filed Jun. 20, 1980, Ser. No. 161,380

Int. Cl.³ H01R *4/20*

U.S. Cl. 339—223 R **15 Claims**



1. An electrical connector made from a one-piece body adapted to terminate or join at least one electrical lead wire having an insulating sheath containing conductor means, said connector comprising connector means adapted for termination or joinder and a reinforced wire barrel having nested radially inner and outer cylindrical walls which have side edges contacting opposite surfaces of an offset web extending between and interconnecting the two cylindrical walls, the reinforced wire barrel being adapted to receive the conductor means of said lead wire for termination or joinder.

4,371,230

ELECTRIC CONNECTOR

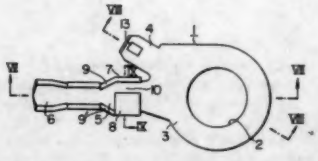
Nori Inoue, Yokkaichi, Japan, assignor to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed Feb. 2, 1981, Ser. No. 230,793

Claims priority, application Japan, Feb. 2, 1980, 55-11668

Int. Cl.³ H01R *11/12, 11/32*

U.S. Cl. 339—242 **4 Claims**



1. An electric connector comprising:

a flat ring-shaped terminal portion having a bolt hole formed therein;

a tab extending radially outwardly from said ring-shaped terminal portion;

a portion for receiving a tab of another like connector and having a tab insertion opening, said tab receiving portion extending radially outward from said terminal portion at an angle with respect to said tab;

a wire crimping portion extending from the outer end of said tab receiving portion in substantially the same radial direction as said tab receiving portion;

said tab and said tab receiving portion being arranged such that the tab of one electric connector may be inserted into and securely held in the tab insertion opening of another electric connector with the ring-shaped terminal portion of the one connector superposed on the ring-shaped terminal portion of the another connector.

4,371,231

ELECTRICALLY CONDUCTIVE CONNECTION OF THE ACTIVE PORTIONS OF AN ELECTRICAL COMPONENT OR OF AN INTEGRATED CIRCUIT TO TERMINALS

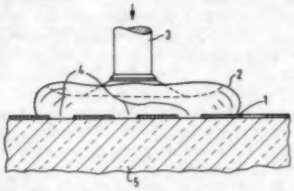
Albert Jung, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 192,323

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1979, 2945670

Int. Cl.³ H01R 5/04

U.S. Cl. 339—275 R **6 Claims**



1. An electrically conductive connection of the active part of a semiconductor layer of an electrical component to a terminal for external connection, comprising, a very thin gold wire having one end connected to the external connection terminal; a metal contact layer having a large group of perforation holes bonded on the semiconductor layer of the electrical component and a contact head at the other end of the gold wire being connected by thermocompression to a portion of the metal layer, the contact head being additionally deformed as a result of deformation into a plurality of said group of perforation holes.

4,371,232

GRADED GAP SEMICONDUCTOR OPTICAL DEVICE

James D. Jensen, Highland, and Richard B. Schoolar, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

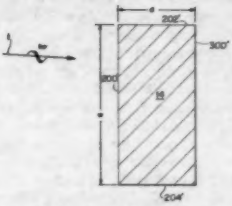
Division of Ser. No. 864,417, Dec. 27, 1977, Pat. No. 4,227,948. This application Apr. 25, 1980, Ser. No. 143,695

Int. Cl.³ H01L 27/14; G02B 1/02

U.S. Cl. 350—1.4 **29 Claims**

1. A lens comprising:

a layer geometrically described by the orthogonal dimensions of thickness and width, the layer being prepared from a lead alloy having a cadmium-chalcogenide mole fraction, the cadmium-chalcogenide mole fraction of the



layer depending upon at least one of the orthogonal dimensions.

4,371,233

LENS-APPLIED OPTICAL FIBER CONNECTOR

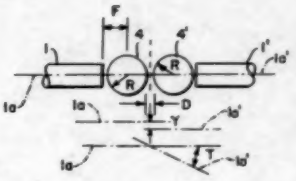
Sigefumi Masuda, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

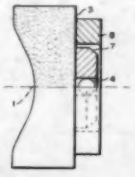
Filed Jun. 25, 1980, Ser. No. 162,875

Claims priority, application Japan, Jul. 11, 1979, 54-94498[U]; Aug. 28, 1979, 54-108576; Dec. 13, 1979, 54-160748[U]; Dec. 27, 1979, 54-182197; Dec. 28, 1979, 54-170982

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.18 **13 Claims**





13. A lens-applied optical fiber connector for connecting first and second optical fibers, comprising:

first and second cylindrical sleeves, each having a hole along its central axis through which the first and second optical fibers, respectively, are inserted;

a hollow cylindrical adapter having a through hole through which said first and second cylindrical sleeves are inserted from opposite sides;

first and second lenses arranged between the first ends of said first and second cylindrical sleeves so as to be placed face to face in the through hole of said hollow cylindrical adapter, the first and second optical fibers optically connected via said first and second lenses, said first and second lenses being spherical lenses having a focal length of from 0.09 to 0.27 mm, said first and second lenses positioned at a point on the optical axis of the first and second optical fibers equal to the focal length, the end surface of

each of the first and second optical fibers being shaped with a gradient angle defined by the angle of

$$Y/f\,(n_0-1)$$

where, Y is the axial deflection between the optical axis of the first and second optical fibers and the center line of said hollow cylindrical adapter, f is the focal length of each of said first and second spherical lenses and n_0 is the refraction coefficient of the first and second optical fibers;

first and second lens holders for holding said first and second lenses, respectively, said first and second lens holders thicker than said first and second lenses; and

first and second guard means for protecting said first and second lens holders, respectively, said first and second guard means thicker than said first and second lens holders, said first and second guard means connected to the first ends of said first and second cylindrical sleeves.

4,371,234

SUBMARINE OPTICAL CABLE

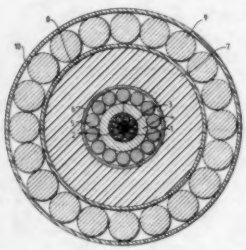
Colin S. Parfree, and Peter Worthington, both of Southampton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 13, 1980, Ser No. 206,425

Claims priority, application United Kingdom, Nov. 15, 1979, 7939606

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **4 Claims**



1. An optical fiber cable including a central cylindrical strength member, a plurality of coated optical fibers laying about the surface of said strength member, a layer of thermoplastic or rubber-like material enclosing the optical fibers, a metallic tube enclosing and laying about said layer, said tube being usable as an electrical conductor, a layer of high tensile steel wires laying about said metallic tube, a further tube of metal enclosing said layers of wires, and a sheath of an insulating material laying about said further metal tube.

4,371,235

IMAGE CONTROL MIRROR

Travis E. Locke, Sr., 4522 U.S. 36 W., Greenville, Ohio 45331

Continuation-in-part of Ser. No. 67,955, Aug. 20, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,697

Int. Cl.³ B60R 1/06

U.S. Cl. 350—280 **3 Claims**

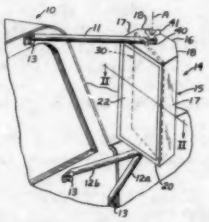
1. An image control mirror for exterior mounting on trucks, tandem trailers, commercial vehicles and the like, said mirror comprising in combination:

an exterior housing;

a transparent front lens connected to said housing;

a mirror image-providing surface arranged within said housing, said mirror image-providing surface being pivoted on only one side with the other side being locatable selectively in either of a normal position as close to as well as parallel to said lens and an anti-glare position differing at an angle distinctly specific as to said transparent front lens to substantially prevent both day and night glare and also simultaneously automatically refractively avoiding second or third multiple images which distract from proper undistorted image maintained therewith, said distinctly specific angle being within a range equal to about 2.25 to 3.9 times the distance in inches at a value determined multiply per inch of transverse width of said surface;

gasket means mounted in said housing both for hermetic sealing of space between said lens and said mirror surface and also to serve as a vibration dampener therewith, means for locating said surface at the selected angle and at least one of said surface and said housing being mounted externally so as to be pivotal only about a vertical axis, the transverse width being approximately six inches, and the angle being approximately in a range between 14° and 20.5°, said mirror image-providing surface being provided on a member mounted in said housing, said member being transparent, and said surface being provided by a second surface coating on that side of said member remote from



said front, and further including means for safety illuminating and electrically heating said member, said member being a prism providing both said transparent front lens and said mirror image-providing surface, and further including means for operatively retaining said member in said housing including a profiled retaining element operatively connectible to said housing, and seal means operatively connectible between said retaining element and said member, said means for retaining said member including:

a vertical shaft operatively connectible in said housing between a pair of opposed walls thereof;

means for securing said member to said shaft so that said mirror image-providing surface is pivotal about the longitudinal axis of said shaft; and

means operatively connectible to said member for moving said member, said means extending at least in part exteriorly of said housing for actuation thereof, foil-type means for electrically heating said member, said member being a prism, said angle being equal to about 3.4 times the distance in inches of transverse width of said surface.

4,371,236

ELECTROCHROMIC DISPLAY USING RARE-EARTH DIPHTHALOCYANINES AND A LOW FREEZING-POINT ELECTROLYTE

Margie M. Nicholson, San Marino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 36,967, May 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 948,364, Oct. 4, 1978, Pat. No. 4,184,751, which is a continuation of Ser. No. 752,950, Dec. 20, 1976, abandoned. This application May 29, 1981, Ser. No. 268,508

Int. Cl.³ G02F 1/17

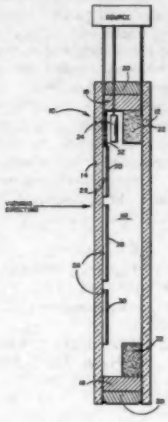
U.S. Cl. 350—357 **10 Claims**

1. An electrochromic display cell capable of assuming a plurality of visually distinct optical states at very low temperatures with response times less than 50 milliseconds comprising:

transparent electronically conductive display electrode means;

counterelectrode means for establishing a potential difference relative to said display electrode means;

a layer of electrochromic material comprising a rare earth diphthalocyanine complex disposed on said display electrode means; and



an electrolyte material interposed between said film on said display electrode means and said counterelectrode means in order to pass ionic current;

wherein said electrolyte material is a concentrated aqueous solution of metal salt which solution freezes at a temperature below approximately −50 C.

4,371,237

APPARATUS FOR MEASURING CURVATURES OF A SPHERICAL SURFACE

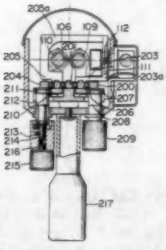
Kiichi Kamiyama, and Yoshinori Oana, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 945,866, Sep. 26, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,412

Claims priority, application Japan, Sep. 30, 1977, 52-117580; Sep. 30, 1977, 52-131693[U]

Int. Cl.³ A61B *3/10, 3/00*

U.S. Cl. 351—245 **3 Claims**



1. A single hand actuating means for an ophthalmoscopic instrument having a body and means mounting said body for swingable adjustment and at least two adjusting devices provided in the body, said adjusting devices being connected to first and second movable optical elements, said body being provided with a downwardly extending handle for the swingable adjustment of the body, a pair of adjusting knobs provided on said body at the opposite sides of the handle and connected with respective ones of the adjusting devices, one of said adjusting knobs being longer than the other knob whereby the knobs can conveniently be actuated by fingers of a hand gripping the handle.

4,371,238

SPECTACLES FRAME

Bernard Lhospice, Blois, France, assignor to Essilor International Cie Generale d'Optique, Cretail, France

Filed Oct. 16, 1980, Ser. No. 197,707

Claims priority, application France, Oct. 16, 1979, 79 25654; Aug. 22, 1980, 80 18335

Int. Cl.³ G02C *1/04*

U.S. Cl. 351—106 **18 Claims**

1. Spectacle frame of the kind comprising a main structure and, carried by the latter, two surrounds or rims which are suitable for receiving a spectacle lens, each of the said surrounds or rims comprising, on the one hand, an upper rim suitable for cooperating, by interlocking, with a spectacle lens, and, on the other hand, a flexible rim cord suitable for being fixed to the main structure at each of its ends, by passing through two holes associated with the said main structure, characterized in that, for at least one of the ends of the flexible rim cord, four holes are provided in combination, two holes being formed in the main structure, and two holes being formed in the upper rim in question, the said holes being in corresponding pairs from the said main structure to the said upper rim, so that the said flexible rim cord fastens the upper rim to the main structure.

4,371,239

FILM POSITIONING DEVICE FOR MICROFORM PRINTING SYSTEM

Shigenori Oosaka, and Makoto Murakoshi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 959,850, Nov. 13, 1978, Pat. No. 4,247,197. This application Sep. 3, 1980, Ser. No. 183,731

Claims priority, application Japan, Nov. 14, 1977, 52-136451; May 23, 1978, 53/61470

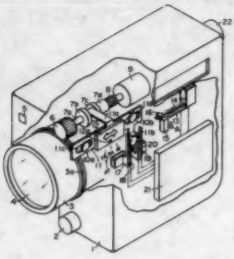
The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—26 R **7 Claims**

1. A film positioning device for a microform printing system for moving a microfilm in a horizontal plane so that a selected area of the microfilm is presented to a film aperture for recording, comprising a flat base plate, a microfilm carrier including a transparent portion slidably disposed on the base plate for holding the microfilm on the base plate, a sliding spacer fixed to the carrier for supporting the carrier at a predetermined distance above the base plate, a film feed means for feeding the film relative to the carrier and a driving means for moving said carrier in X and Y-directions, said driving means including first and second parallel X-directional guide bars extending in the X-direction spaced from each other, a main bracket slidable

along the first X-directional guide bar, a sub-bracket slidable along the second X-directional guide bar, first and second parallel Y-directional guide bars extending in the Y-direction between the main bracket and the sub-bracket, the opposite ends of each Y-directional guide bar being respectively secured to the main bracket and the sub-bracket, said carrier being operatively connected to the Y-directional guide bars and being slidable therealong, a first electric motor which rotates to move the main bracket back and forth together with said carrier along said first X-directional guide bar and a second electric motor which rotates to move the carrier back and forth along the Y-directional guide bars independent of said main bracket, said sliding spacer keeping said distance between the base plate and the carrier constant during movement of the carrier in X- and Y-directions, a viewing means, the film feed means feeding the film relative to the transparent portion of the carrier and the drive means moving the carrier in X- and Y-directions to align a further selected area of recorded information on the microfilm with the viewing means so that the further selected area may be viewed.



4,371,240

MOTION PICTURE CAMERA HAVING AN AUTO-FOCUS ADJUSTING DEVICE

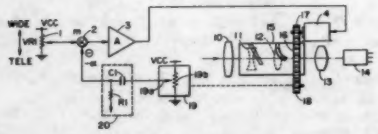
Ichiro Shimizu, Tokyo; Yoshio Komine, Yokohama, and Makoto Masunaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,247

Claims priority, application Japan, Sep. 25, 1979, 54-123005

Int. Cl.³ G03B *3/00*

U.S. Cl. 352—140 **14 Claims**



1. An automatic focusing system comprising:

(a) a focus adjustable lens means adapted to be focused on an object;

(b) an automatic focusing means for automatically focusing said lens means on the object;

(c) actuating means for actuating said automatic focusing means;

(d) mode selecting means for selecting a focusing mode of the system, said mode selecting means being selectively set at one of first, second and third positions;

(e) supplementary means having non-operated and operated positions; and

(f) control means responsive to said trigger means, mode selecting means and supplementary means to control the operation of said automatic focusing means, said control means

(1) setting said automatic focusing means at an inoperative state in which said automatic focusing means is inoperative irrespective of the operation of said actuating means and in which said lens means is permitted to be manually adjusted, when said mode selecting means is set at said first position;

(2) operating said automatic focusing means only once in response to each of the operations of said actuating means and supplementary means and holding said automatic focusing means ineffective irrespective of changes in the distance between the system and the object after once said lens means has been focused on the object, when said mode selecting means is set at said second position; and

(3) continuously operating said automatic focusing means in response to said actuating means as long as said supplementary means is in the non-operated position while holding said automatic focusing means ineffective as long as said supplementary means is in the operated position, when said mode selecting means is set at said third position.

4,371,241

MOVING PICTURE CAMERA IN WHICH CONSTANT SPEED ZOOMING IS EFFECTED

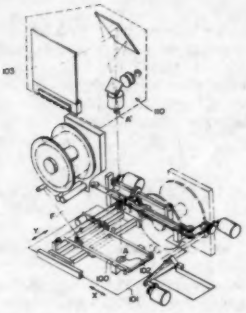
Kenji Fujikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,946

Claims priority, application Japan, Jul. 9, 1980, 55-93713

Int. Cl.³ G03B *3/10*

U.S. Cl. 352—140 **6 Claims**



1. A moving picture camera provided with:

objective optical means having a plurality of movable groups;

control means for controlling the movement of said groups for zooming;

an electrical device for driving said control means;

converter means coupled to said electric device for converting the displacement of said control means into a voltage variation; and

a differentiation circuit for differentiating said voltage variation and inputting the result to said electric device.

4,371,242

OBJECTIVE LENS EXCHANGING ARRANGEMENT IN A MICROFILM READER

Karl-Heinz Dietrich; Josef Gruber; Walter Rauffer, all of Munich, and Peter Nassl, Gauting, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,402

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002844

Int. Cl.³ G03B *3/00*

U.S. Cl. 353—101 **12 Claims**

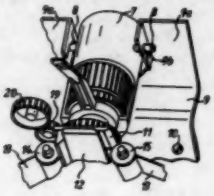
1. In a microfilm reader, an objective lens tube removal or exchanging arrangement, comprising in combination,

a base through which a microfilm is adapted to be guided;

an objective lens tube;

a cylindrically shaped casing operatively mounted in said base and adapted to slidably adjustably support said objective lens tube therein along its optical axis, said casing having an opening sufficiently large to permit the removal or exchange of the objective lens tube therethrough in a direction substantially normal to the optical axis thereof,

said casing further including a first closed portion which confronts said microfilm, said first closed portion subtends an arc in excess of 180° about the axis of said cylindrically



shaped casing, said opening adjoining said first closed portion, said objective lens tube being guidingly supported along its optical axis in the first closed portion of said casing;

said casing further including a second closed portion which also subtends an arc in excess of 180° about the axis of said cylindrically shaped casing, said opening also adjoining said second closed portion at its end opposite the end at which it adjoins the first closed portion; and

a rotary prism being rotatably adjustably mounted in said second closed portion.

4,371,243

PHOTOGRAPHIC MODE SELECTOR SYSTEM

Yoshiyuki Takishima; Masanori Uchidoi, both of Yokohama; Yukio Mashimo, Tokyo; Hiroshi Aizawa, Kawasaki, all of Japan, and Stephen C. Kwan, Plano, Tex., assignors to Canon Kabushiki Kaisha, Tokyo, Japan and Texas Instruments Incorporated, Tex.

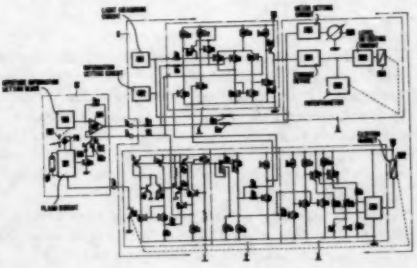
Continuation of Ser. No. 64,579, Aug. 7, 1979, abandoned, which is a continuation of Ser. No. 764,272, Jan. 31, 1977, abandoned.

This application Aug. 31, 1981, Ser. No. 298,334

Claims priority, application Japan, Jan. 30, 1976, 51-9073

Int. Cl.³ G03B *7/085, 15/05*

U.S. Cl. 354—43 **42 Claims**



1. A camera operable with an automatic flash unit, comprising:

a diaphragm variable in response to electrical input signals,

a shutter having means for selecting a flash shutter time suitable for flash operation and having means for selecting settable shutter times,

a control circuit responsive to light and the set times of said means for selecting settable shutter times, for producing a control signal,

an input for responding to a variable diaphragm signal from the flash unit,

sensor means for sensing three levels of current in response to external signals and for maintaining the current levels constant, and

mode selector means coupled to said sensor means for connecting the control circuit to the variable diaphragm and enabling the means for selecting settable shutter times in response to one of the current levels, for applying the input signals to the diaphragm and enabling the means for selecting settable shutter times in the shutter in response to another of said current levels, and for connecting the input to the diaphragm and for enabling the means for selecting a flash shutter time in the shutter in response to still another of the current levels.

4,371,244

APPARATUS FOR CONTROLLING FILM ADVANCEMENT IN A CAMERA

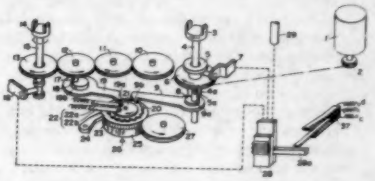
Koichi Daitoku, Sagamihara; Kenji Sekine; Nobuo Matsukawa, both of Kawasaki, and Shiro Sugimori, Sagamihara, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 230,015

Claims priority, application Japan, Feb. 5, 1980, 55-12681

Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173 **9 Claims**



1. In a camera having a film transport mechanism for advancing film frame-by-frame and for rewinding advanced film, and having a counter operable in response to the advancement of the film for counting the number of frames advanced by the transport mechanism, the improvement comprising first control means responsive to the counter reaching a predetermined count for controlling the transport mechanism so as to prevent further advancement of the film, and second control means responsive to the transport mechanism effecting a rewind operation to rewind the film for automatically disabling the first control means so as to enable further film advancement by the transport mechanism.

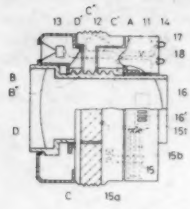
4. The camera of claim 1 further comprising means for setting the counter to count a number of frames corresponding to said predetermined count, said setting means being operable to cause the first control means to assume a condition in which it does not prevent advancement of the film by the transport mechanism.

5. The camera of claim 4, wherein the film transport mechanism comprises an electrical motor and means for alternatively coupling the motor to a wind-up mechanism for advancing the film and to a rewind mechanism for rewinding the film, and wherein said first control means comprises a power controlling switch having a preventing position that prevents power from being applied to the motor, the switch being in said preventing position upon the counter being at said predetermined count, and wherein said control means comprises means operable upon the film being rewound for causing said power controlling switch to assume a non-preventing position.

4,371,245
PHOTOGRAPHING LENS SYSTEM WITH FOCUS INFORMING MEANS

Hiroshi Iwata, Ikoma; Tsunemi Yoshino, Ibaraki; Toshitsugu Kashihara, Nara, and Akitoshi Morioka, Osaka, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Aug. 5, 1981, Ser. No. 290,402
Claims priority, application Japan, Aug. 8, 1980, 55-109369
Int. Cl.³ G03B *3/00, 13/18;* G02B *7/04*
U.S. Cl. 354—198 **17 Claims**



1. A photographic lens system for a photographic camera comprising,

a photographic lens,

a lens system housing which for holding said photographic lens, including a mounting means for detachable mounting on a camera body, said lens system housing comprising at least a means for adjusting focus by movement thereof and a cooperating handle, by which focussing is made,

an electrically operated distance measuring means, provided in said lens system housing, for measuring distance to a principal object and generating a measured distance signal corresponding to said measured distance,

an electrically operated adjustment indication means, provided in said lens system housing, for generating an adjusted distance signal corresponding to the distance of said principal object at which the lens is adjusted,

an electrically operated comparator circuit which compares said measured distance signal and said lens adjustment signal, and generates a focus information signal,

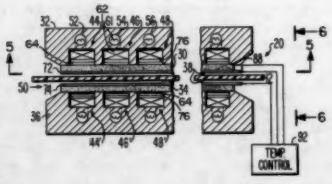
at least one electrically operated informing means responsive to said focus information signal, for generating discernable indicia of said focussing, and

a switch cooperating with a hand on said lens system housing for selectively applying power from a power source to said distance measuring means, said adjustment indication means, said comparator circuit, and said informing means.

4,371,246
THERMAL PROCESSOR

Bohdan W. Siryj, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,595
Int. Cl.³ G03D *7/00*
U.S. Cl. 354—299 **8 Claims**



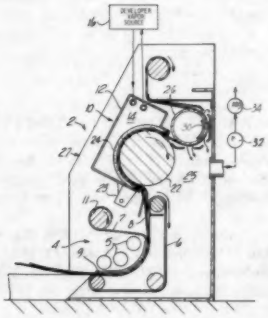
1. In a thermal processor for developing a length of film by heating the same as it passes along a path of a given width in the direction of the length dimension of the path, said processor including thermally conductive gas distribution means comprising a porous homogeneous material through the pores of which gas is distributed to the film over the width of the path, means for supplying said gas to said distribution means, first heating means for heating said distribution means over said width of said path adjacent said distribution means, the improvement comprising:

second heating means extending along the length dimension of said path, thermally conductively secured to the distribution means adjacent to and beyond the edges of said film, when the film is present in said path, for providing heat to said distribution means at the edges of said path adjacent to the edges of the film, to thereby reduce density variation in said film along the width dimension of the film.

4,371,247
ARRANGEMENT FOR ELIMINATING AMMONIA VAPORS FROM DEVELOPED DIAZO COPY MATERIAL

Robert K. Hewelt, 3275 Hagerman, Leonard, Mich. 48038, and Edward F. Dohring, Westland, Mich., assignors to Robert K. Hewelt, Leonard, Mich.

Division of Ser. No. 36,478, May 7, 1979, Pat. No. 4,273,435.
This application May 12, 1980, Ser. No. 148,635
Int. Cl.³ G03D *7/00*
U.S. Cl. 354—300 **3 Claims**



1. A diazo copying machine for developing diazo copy material comprising:

a machine frame;

a development chamber;

means for circulating developer gases through said chamber;

means for causing exposed diazo copy material to be passed through said development chamber, said means including a drive cylinder and means for rotating said cylinder;

said development chamber being comprised in part by a trough extending along the length of said drive cylinder and including means positioning the open face of said trough against said drive cylinder;

a mesh layer secured extending across said open face of said trough to be pressed against said drive cylinder, with said trough in position against said drive cylinder;

feed means for feeding said exposed copy material between said drive cylinder and said mesh layer;

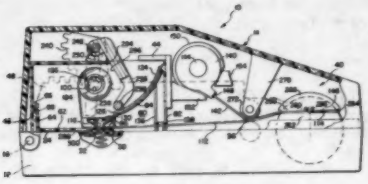
said means positioning said trough including pivotal support means retaining the trough to the frame and enabling swinging movement of said trough about said support means towards and away from said position against said drive cylinder, whereby said trough can be selectively positioned away from said drive cylinder for ready access to the interior thereof for maintenance thereof.

4,371,248

APPARATUS FOR OPENING A FILM PROCESSING KIT

Donald J. Sulesky, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 1, 1982, Ser. No. 353,426
Int. Cl.³ G03D 5/06
U.S. Cl. 354—304 6 Claims



1. Film processing apparatus of the type adapted to receive a disposable kit for use in the processing of an exposed roll of film, the disposable kit including a housing having first and second sections coupled to each other for movement between open and closed positions, a container of processing liquid mounted within the second section, a processing liquid dispenser located adjacent a rupturable end of the container, and a roller supporting a length of flexible sheet material, said film processing apparatus comprising:

a housing having means for locating the disposable kit such that a free end of the sheet material may be operatively joined with a free end of an exposed roll of film, said housing including a loading door movable into a closed position;

means for moving the first section from the closed position to the open position, said moving means being operatively coupled to the first housing of the disposable kit during the positioning of the latter at said locating means;

means for rupturing the processing liquid container located within the kit, said rupturing means being located closely adjacent said locating means when said loading door is in its closed position; and

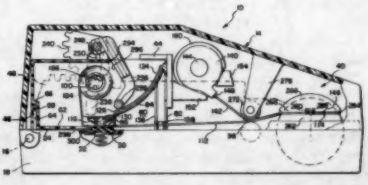
manually operable means coupled to said moving means and to said rupturing means such that actuation of said manually operable means in a first direction initially drives said moving means to move the first section of the kit's housing toward the open position and thereafter drives said rupturing means into the open housing so as to engage and rupture the container of processing liquid thereby permitting the liquid to flow into the dispenser for subsequent application to the sheet material.

4,371,249

FILM PROCESSING KIT

Frank M. Czumak, Salem, N.H., and Peter K. Fichter, Canton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 1, 1982, Ser. No. 353,427
Int. Cl.³ G03D 5/06
U.S. Cl. 354—304 6 Claims



1. A disposable kit configured to be placed within a film processing apparatus wherein it is adapted for use in the processing of a photographically exposed roll of instant type transparency film, said kit comprising:

a housing including first and second sections coupled to each other for movement between open and closed positions;

a container of processing liquid supported within said second section, said container having a rupturable section;

a processing liquid dispenser located adjacent said rupturable section of said container, said dispenser including a nozzle through which the processing liquid is adapted to flow;

a roller rotatably supported within said housing;

a strip of sheet material wound upon said roller with a first end secured to said roller and a second end which extends to a position in engagement with said nozzle and thence to the exterior of said housing, said sheet material being adapted to be partially withdrawn from said housing and superposed with the exposed film to form a laminate having a coating of processing liquid therebetween; and

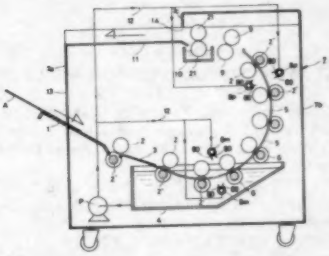
said first section further includes means cooperable with a component of the film processing apparatus for moving said first section from said closed position to said open position wherein a rupturing mechanism of the film processing apparatus may enter said housing and rupture said container whereby said processing liquid may then flow into said dispenser for subsequent application to said sheet material via said nozzle as said sheet material is being withdrawn from said housing.

4,371,250

DEVELOPING PROCESSOR FOR PRINTING PLATES HAVING A SPRAY TUBE DEVELOPER AGITATOR

Masayoshi Wakabayashi, and Matsuyoshi Taniguchi, both of Shiga, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Oct. 6, 1981, Ser. No. 309,501
Claims priority, application Japan, Oct. 7, 1980, 55-143830[U]
Int. Cl.³ G03D 3/04
U.S. Cl. 354—325 4 Claims



1. A developing processor for printing plates comprising:

a machine housing,

a relatively shallow developer tank disposed at a bottom portion within said housing and holding a developer therein,

a spray tube provided within said housing above said developer tank and adapted to jet developer onto a printing plate to be processed, and

an agitator spray tube having a number of jet holes and disposed in said developer held in said developer tank, said agitator spray tube being connected to said developer tank through a pipe line and a pump and adapted to agitate the developer in the developer tank,

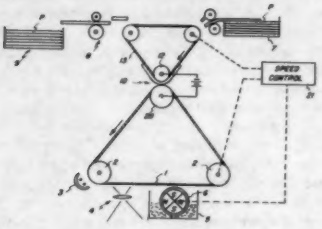
wherein an arrangement is made such that said printing plate to be processed is passed through said developer tank and then treated with the developer jetted from said spray tube.

4,371,251

ELECTROGRAPHIC METHOD AND APPARATUS PROVIDING IMPROVED TRANSFER OF NON-INSULATIVE TONER

Theodore H. Morse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1981, Ser. No. 239,100
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **14 Claims**



1. In a process for electrographic imaging using an electrically insulative imaging member, electrically non-insulative toner and a transfer member of high relative-conductivity, the improved toner transfer procedure comprising:

(a) moving successive portions of such an imaging member, bearing non-insulative toner having a charge of a first polarity, through a transfer zone;

(b) moving successive portions of such a high relative-conductivity transfer member through said transfer zone in opposing relation to respective portions of the toner bearing surface of said insulative imaging member;

(c) electrically biasing the non-opposing surface of said transfer member portions within said transfer zone at a predetermined potential level, opposite in polarity to said first polarity; and

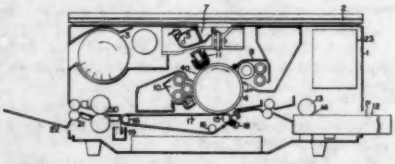
(d) contacting said opposing transfer member and imaging member portions within said transfer zone for a predetermined contact period not exceeding about 0.030 seconds.

4,371,252

CONTACT TYPE CHARGING DEVICE WITH PLIABLE CONTACT MEMBER

Kohachi Uchida, Sagamihara; Yoshitsugu Nakatomi, Yokohama; Toshimasa Takano, Sagamihara, and Hideo Mukai, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1981, Ser. No. 241,113
Claims priority, application Japan, Mar. 10, 1980, 55-30093; Apr. 18, 1980, 55-51242
Int. Cl.³ G03G *15/02*
U.S. Cl. 355—3 CH **17 Claims**



1. A charging device comprising:

a base;

a cushioning layer formed on that portion of said base which faces an object to be charged;

an electrode attached to that side of said cushioning layer which faces said object to be charged;

a contact member connected to said electrode contacting said object to be charged, said contact member having a prescribed electrical resistance greater than the electrical resistance of said electrode, said contact member including a fiber base and a large number of fibers planted on said fiber base;

conductive adhesive for attaching said fiber base to said electrode; and

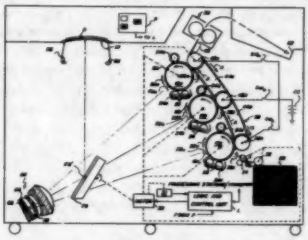
means for supplying voltage on said electrode to charge said object to be charged.

4,371,253

COLOR ELECTROPHOTOGRAPHIC COPIER

Pierce B. Day, Pittsford, and Carl M. Marsiglio, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,306
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—4 **9 Claims**



1. In an electrophotographic copier for making multicolor reproductions of a multicolor original document, said copier including photoconductive means, means for forming latent image charge patterns on said photoconductive means respectively corresponding to primary color separation images of the original document, and means for developing such charge patterns with respective complementary colored marking particles, the improvement comprising:

a catadioptric lens assembly optically located between the original document and said photoconductive means, said lens assembly including dichroic mirrors spectrally sensitive respectively to primary colors and tilted respectively relative to each other to separate an image of such original document into primary color separation images and project such images respectively in straight line optical paths toward distinct spatial locations on said photoconductive means.

4,371,254

PROGRAMMED BRAKE FOR CONTROLLING THE SPEED OF A SCANNING CARRIAGE

Jack Beery, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,250
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 **18 Claims**

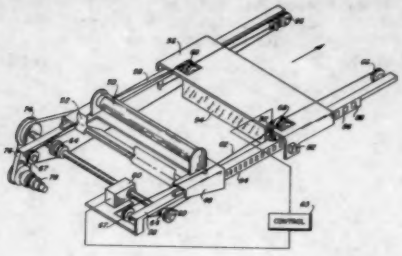
1. In a reproduction machine having a photoreceptor, an optical system, a carriage, a brake mechanically connected to the carriage, and a platen, the carriage scanning the platen in a first direction for projecting images of objects on the platen onto the photoreceptor, by means of the optical system, and

means for controlling the speed of the scanning carriage including a control

a displacement sensor mounted on the carriage and

a grating including a frame having a plurality of spaced apertures, the grating rigidly secured to the reproduction machine, the senor disposed in relation to the grating to

provide signals manifesting the speed of the carriage with respect to the sensor, the control responsive to the signals



to selectively activate the brake to change the speed of the carriage in a second direction.

4,371,255

ELECTROPHOTOGRAPHIC COPYING METHOD AND APPARATUS OF RECIPROCAL ORIGINAL SCANNING TYPE

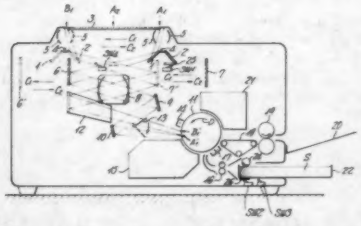
Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 1, 1980, Ser. No. 211,747

Claims priority, application Japan, Nov. 30, 1979, 54/155837; Dec. 5, 1979, 54/157712

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—8 **24 Claims**



1. In a copying method of moving an original and an optical system relative to each other, while moving the surface of a photoconductor in a predetermined direction, and exposing said photoconductor to an optical image of said original through different exposure optical paths at the forward original scanning and at the backward original scanning by said optical system, the improvement wherein the timing of the transportation of a recording sheet to a recording position is changed at the forward original scanning and at the backward original scanning in relation with the relative shifting of said optical system and said original or the timing of said relative shifting of said optical system and said original is changed with respect to a predetermined timing of said transportation of the recording sheet at the forward original scanning and at the backward original scanning, in order to locate at a proper position on said recording sheet with respect to the longitudinal direction when copies are made from originals other than the maximum size original that can be copied.

4,371,256

APPARATUS FOR HANDLING AN ORIGINAL AND A RECORDING SHEET IN A RECORDING DEVICE

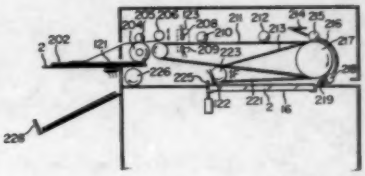
Shigeru Yoshimura, Yokohama, and Katsuichi Shimizu, Hoya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 911,141, May 31, 1978, Pat. No. 4,202,621. This application Nov. 27, 1979, Ser. No. 97,862

Claims priority, application Japan, Jun. 3, 1977, 52-65416; Jun. 14, 1977, 52-70074; Jun. 27, 1977, 52-76391

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **20 Claims**



10. A recording device comprising:

(a) mounting means to mount thereon an original carrying to be recorded;

(b) size detection means to detect a size of said original;

(c) a plurality of storing means, each of which stores therein sheet recording mediums in a predetermined size;

(d) image recording means to read the image information on the original placed on said original mounting means by scanning the same, and to record the image information as a visible image onto the sheet recording medium drawn from the selected storing means;

(e) size detection means to detect a size of the sheet recording mediums stored in each of said storing means, and to give notification of the size as detected; and

(f) storage selection means which selects other storing means when the size of the original detected by said size detection means and the size of the sheet recording medium notified by size notifying means in said storing means as selected do not coincide.

4,371,257

AUTOMATIC CONTROLLER OF ELECTRIFICATION OF MAGNETIC TONER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,392

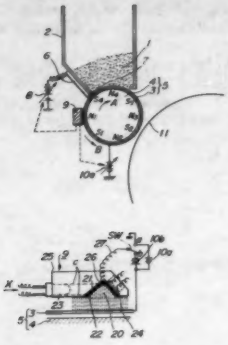
Claims priority, application Japan, Jul. 14, 1980, 55-95855

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **10 Claims**

1. In an automatic controller of electrification of magnetic toner for a developing means having a magnet roll means to magnetically hold and carry developer containing electrically-insulated magnetic toner particles toward a surface to be developed, said magnetic toner particles having magnetic material particles enclosed therein, and an electrifying means related to said magnetic roll means so as to electrify the magnetic toner particles being held by said magnetic roll means, the improvement comprising a detecting electrode disposed adjacent to a position where ear-ups of the developer are formed by said magnet roll means, a bias voltage means applying a bias voltage to said detecting electrode, the polarity of said bias voltage being opposite to that of electric charge on said magnetic toner particles, a light source disposed to project light to the detecting electrode, a photocell disposed to receive the light so as to produce a detection signal representing an amount of the mag-

netic toner particles deposited on said detecting electrode, and a control circuit adapted to control operation of said electrifying means on the basis of said detection signal from said photocell.



4,371,258

ILLUMINATING DEVICE FOR PHOTOGRAPHIC COPYING APPARATUS

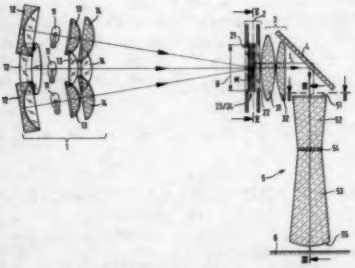
Fred Mast, Wil, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Aug. 21, 1981, Ser. No. 295,101

Claims priority, application Switzerland, Aug. 25, 1980, 6387/80

Int. Cl.³ G03B *27/54, 27/72*

U.S. Cl. 355—37 **17 Claims**



1. In an illuminating device for photographic copying apparatus comprising a light source, an image-producing optical unit, a light-mixing element having a light entry face provided with parallel ribbings, and a filter unit interposed into the path of light rays from the light source to the light-mixing element, which filter unit comprises a window for the passage of light and serves for regulating the color composition of the light emitted by the light source,

the improvement of said ribbings of the light entry face of the light-mixing element being cylindrical lenses arranged in parallel in a row, with every two adjacently located cylindrical lenses being joined with one another forming a sharp edge therebetween and wherein the cylindrical lenses are so dimensioned that the images of the window of the filter unit generated by neighboring cylinder lenses are located adjacent one another substantially free from interspaces therebetween and free from overlappings thereof.

4,371,259

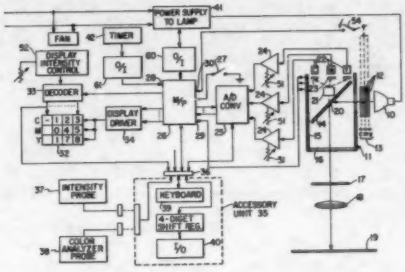
DIGITAL COLOR PRINTER SYSTEM

George L. Howitt, River Edge, N.J., assignor to Charles Beseler Company, Florham Park, N.J.

Filed Jan. 28, 1980, Ser. No. 116,275

Int. Cl.³ G03B *27/73*

U.S. Cl. 355—38 **13 Claims**



1. An integrated, digital photographic color printer system comprising:

a light source,

variable means for controlling a color mixture of light from the source variably with respect to a set of primary colors,

means for directing the variably controlled light as incident light through a photographic film for projecting an image onto a developable photographic medium,

means including photosensors associated with the light directing means for providing signals indicative of the light intensity of the primary colors in the incident light prior to the passage of the light through the photographic film,

means for converting the primary color intensity signals into digital color values,

a probe interfaced with said microprocessor for measuring the intensity of light projected through the photographic film,

means including a microprocessor for storing system data and programs for system functions and for performing programmed functions of the system, including means for measuring the time of exposure for a print, means for deriving color value data from digital color values corresponding to the primary color intensity signals, and means for deriving exposure data from said light intensity and time measurements,

and means for displaying numerically the derived color value and exposure data.

4,371,260

METHOD FOR SETTING UP HIGHLIGHT AND SHADOW POINT DENSITY VALUES OF ORIGINAL PICTURES TO A PICTURE REPRODUCING MACHINE

Takeshi Yoshimoto; Hideki Hiraoka; Seiji Okazaki, all of Kyoto; Yoshihiro Taniguchi, Otsu, and Tsutomu Harada, Ashiya, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 5, 1981, Ser. No. 240,969

Claims priority, application Japan, Mar. 13, 1980, 55-30845

Int. Cl.³ G03B *27/80*

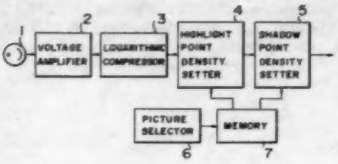
U.S. Cl. 355—77 **3 Claims**

1. A method for setting density values of highlight and shadow points of original pictures in a picture reproducing machine, comprising the steps of:

(a) scanning an original picture while producing a discrimination signal responsive to the scanning of said original picture;

(b) reading highlight and shadow point density values or values corresponding to a density range of said original picture from a memory in which the highlight and the

shadow point density values or the values corresponding to the density ranges of original pictures are stored, by addressing the memory by means of said discrimination signal; and



(c) setting the values read from the memory in the picture reproducing machine.

4,371,261

RANGE FINDER

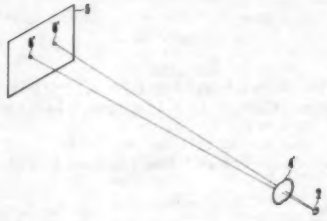
Sadahiko Tsuji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,442

Claims priority, application Japan, Oct. 16, 1979, 54-133403

Int. Cl.³ G01C *3/08*

U.S. Cl. 356—1 **2 Claims**



1. A range finder of the active type, comprising an optical system for projecting a light beam onto an object and scanning the object with the light beam, a light receiving element to receive light reflected from the object, said system having a light emitting element for emitting modulated visible light or infrared light, said system further including a beam projection lens composed of a plurality of parts each having a different optical axis and positioned in front of the light emitting element for simultaneously forming a plurality of images on the object.

4,371,262

HOLDER FOR ABSORPTION SPECTROMETER ATOMIZING FURNACE CAPSULES

Rolf G. A. Tamm, Salem, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlinge, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,628

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730614

Int. Cl.² G01J *3/30*

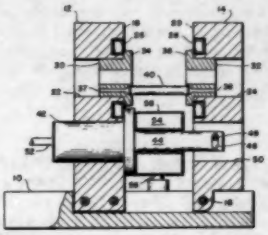
U.S. Cl. 356—312 **7 Claims**

1. An absorption spectrometer atomizing furnace structure for supporting a closed graphite sample capsule in a flame and between first and second electrical heating current electrodes respectively mounted in fluid-cooled first and second housings having coaxial apertures above and adjacent said sample capsule for the passage of a spectrometer measuring beam, said structure comprising:

a base member;

means for rigidly connecting the first fluid-cooled housing to said base member;

pivot means coupling the second housing to said base member in spaced and facing relationship with said first housing, said pivot means permitting said second housing to swing away from said first housing to facilitate removal and insertion of the graphite sample capsule;



said second housing being pivoted by a pneumatic actuator including a pneumatic cylinder coupled to said first housing and operating a piston rod the distal end which engages a pivot pin coupled to said second housing; and

a burner assembly loosely coupled to said piston rod, said burner assembly comprising an annular chamber having a flat exterior surface section containing a plurality of gas outlets.

4,371,263

DOUBLE MONOCHROMATOR

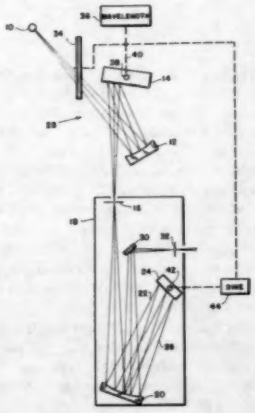
Wolfgang W. F. Witte, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,405

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730613

Int. Cl.² G01J *3/18*

U.S. Cl. 356—333 **21 Claims**



1. A double monochromator comprising:

a first monochromator stage, and

a second monochromator stage having entrance and exit slits,

said first monochromator stage including means for generating, from light rays received from a light source, a first spectral band having a predetermined bandwidth, and

means for imaging said first spectral band at the entrance slit of said second monochromator stage;

said second monochromator stage including means for generating from the first spectral band of light imaged at the entrance slit, a second spectral band having a predetermined bandwidth, and means for imaging said second spectral band at the exit slit of said second monochromator stage;

the generating means of said first monochromator stage being disposed to generate a spectral bandwidth substantially greater than the spectral bandwidth generated by the generating means of said second monochromator stage.

4,371,264

OPTICAL SYSTEM FOR ALIGNING TWO PATTERNS AND PHOTO-REPEATER USING SUCH A SYSTEM

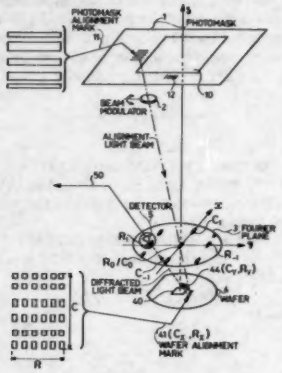
Michel Lacombat, and Georges Dubroeucq, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 25, 1980, Ser. No. 124,077

Claims priority, application France, Feb. 27, 1979, 79 05007

Int. Cl.³ G01B *11/00*; G02B *5/18*

U.S. Cl. 356—356 **20 Claims**



1. An optical system for aligning along a plurality of aligning axis at least a first pattern, carried by a first mobile medium, in relation to a second pattern, carried by a second medium, forming a first fixed reference, said system comprising for each alignment axis:

first and second patterns each comprising at least one principal optical network formed by a series of parallel strokes whose width and spatial distribution in a first direction are parallel to its respective alignment axis and are determined by a particular distribution code where the strokes of the first pattern are interrupted periodically in a second direction to form an optical network having a constant pitch in said second direction;

a monochromatic source of light energy combined with optical means for illuminating said first pattern by projection on said first pattern of the image of said second pattern with a predetermined magnification and for producing orders of diffraction in said first and second direction; and

means for detecting the intensity of a predetermined part of non-zero order patterns of said orders of diffraction in the second direction, said detected intensity passing through a maximum with accurate alignment being obtained when the spatial correlation of said first pattern and of the projection of the image of said second pattern on said first pattern is a maximum.

4,371,265

DOT PERCENTAGE MEASURING DEVICE

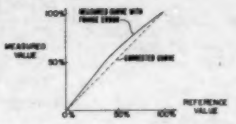
Yuji Mitsuhashi, Fujisawa, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 941,174, Sep. 11, 1978, Pat. No. 4,264,210. This application Sep. 23, 1980, Ser. No. 190,171

Claims priority, application Japan, Sep. 13, 1977, 52-110150; Mar. 25, 1978, 53-38440

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—432 **1 Claim**



1. A dot percentage measuring means comprising:

a light receiving section provided inside a measuring washing table; and

a light emitting section adapted to emit a predetermined intensity of light to a radiated object to be measured on said measuring table, said light emitting section being fixedly provided to confront said light receiving section to measure a dot percentage a transmitting density of said object from a quantity of light passed through said object.

4,371,266

TELEVISION GHOST DETECTOR SYSTEM

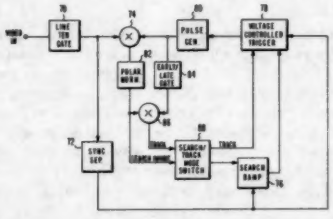
David D. Holmes, Chesterfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1981, Ser. No. 230,310

Claims priority, application United Kingdom, Aug. 14, 1980, 8026515

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **6 Claims**



1. In a television receiver, including a source of video signals which may be contaminated with a ghost signal, said video signals including a component subject to use as a training signal, a television ghost detection system comprising:

means responsive to said video signals and having an output for passing a portion of said video signals which includes said training signal and a ghost of said training signal when a ghost signal is present;

a reference signal circuit having an input responsive to said training signal for producing a varying reference signal at an output;

signal generating means having an input coupled to the output of said reference signal circuit and an output, and responsive to said reference signal for producing, in a first mode of operation, a sequence of search signals;

a coincidence detector having a first input coupled to said output of said video signal portion passing means, a second input coupled to the output of said signal generating

means, and an output at which a coincidence signal is produced, when said signal generating means is operating in said first mode, in response to the application of a ghost of said training signal to said first input in time coincidence with the application of a search signal to said second input; and

means, coupled between the output of said coincidence detector and said reference signal circuit, and responsive to said coincidence signal for storing the level attained by said varying reference signal when said coincidence signal is produced,

wherein said stored reference signal level is representative of the delay of said ghost signal of said video signals with respect to said video signals.

4,371,267

TIME DETECTING DEVICE FOR ALARM CLOCK

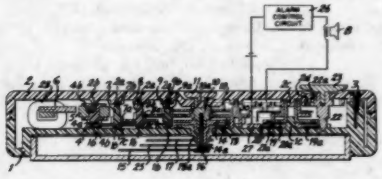
Masuo Ogihara; Nobuo Shinozaki; Tadashi Ishikawa, and Yoichi Seki, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 19, 1980, Ser. No. 218,180

Claims priority, application Japan, Jan. 17, 1980, 55-3942

Int. Cl.³ G04B *23/02*; G04C *21/16*

U.S. Cl. 368—74 **3 Claims**



1. In an alarm clock comprising an hour gear wheel for indicating time, an alarm gear wheel for indicating alarm time, and a second hour gear wheel and a second alarm gear wheel engaging with said hour gear wheel and said alarm gear wheel respectively, and adapted to actuate an alarm device in coincidence of the respective phases of said second alarm gear wheel, a time detecting mechanism characterized by provision of an axially shiftable alarm cam plate having a guide face at which said alarm cam plate is continuously pushed and turned by said second hour gear wheel and a projection penetrating through said second hour gear wheel and related with a cavity formed on said second alarm gear wheel for detecting alarm time.

4,371,268

TIME CORRECTING CIRCUIT FOR TIMEPIECE WITH ELECTROCHROMIC DISPLAY

Hiroshi Miyasaka, and Shinji Yamada, both of Saitama, Japan, assignors to Rhythm Watch Company Limited, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 219,910

Claims priority, application Japan, Dec. 28, 1979, 54-170966; Nov. 18, 1980, 55-162154

Int. Cl.³ G04C *19/00, 9/00*

U.S. Cl. 368—82 **5 Claims**

1. A time correcting circuit for a timepiece with electrochromic display comprising:

a means for generating time standard clock signals;

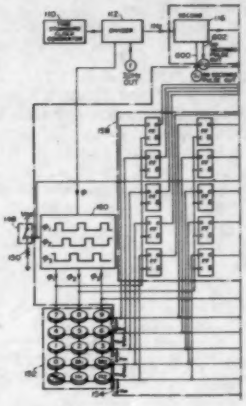
a timing circuit having counters for counting said time clock signals and for generating time display output signals;

a time display circuit having an electrochromic display section for displaying said output signals from said counters;

a correction mode changeover switch for selectively switching between a time display mode and time correction mode;

a correcting circuit which functions only when said correction mode is selected to change the contents of said counters in said timing circuit;

a writing and erasing control circuit for controlling the timing of writing and erasing of said electrochromic display section in response to the selected mode of said correction mode changeover switch; and



a correction pulse generating circuit for outputting time correction writing pulses of a smaller pulse width than writing and erasing pulses during normal time display when said correction mode is selected by said correction mode changeover switch.

4,371,269

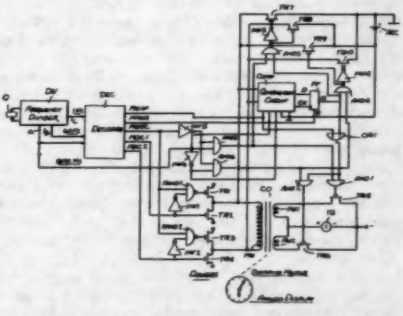
D-C VOLTAGE CONVERTER FOR A WRISTWATCH

Hans-Rudolf Sutter, Pieterlen, Switzerland, assignor to Bulova Watch Co., Inc., Flushing, N.Y.

Filed Sep. 9, 1980, Ser. No. 185,493

Int. Cl.³ G04C *10/04*

U.S. Cl. 368—205 **15 Claims**



1. An electronic wristwatch provided with a low voltage d-c supply source and an electronic circuit having a high-frequency time base whose output is coupled to a multi-stage frequency divider whose output stage yields low-frequency timing pulses to actuate a time display, and a converter which functions to increase the voltage of the source to a level sufficient to energize the electronic circuit, said converter comprising:

(A) a transformer having a primary and a secondary;

(B) a periodically-actuated chopper interposed between the

source and the primary whereby an a-c voltage is induced in the secondary;

(C) a rectifier circuit connected to the secondary and having at least one controllable switch element; and

(D) means to derive intermediate frequency pulses from an intermediate stage of the divider to govern the on-off state of said switch element in synchronism with the periodically-actuated chopper to cause said element to effect rectification of the a-c voltage.

4,371,270

BLOCK SIGNAL FORMING DIGITAL PROCESSOR WITH ERROR CORRECTION

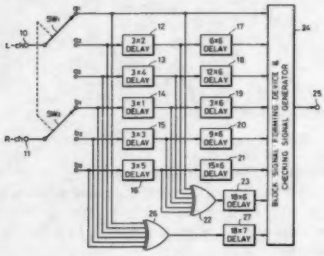
Yasuhiro Yamada, Fujisawa, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 85,320, Oct. 16, 1979, abandoned. This application May 22, 1981, Ser. No. 266,611

Claims priority, application Japan, Oct. 17, 1978, 53-127718

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—38 **8 Claims**



1. A digital signal processing apparatus for use in recording a composite digital signal composed of modulated digital signals, obtained by digitally processing an information signal with a specific sampling period and composite synchronizing signals, and reproducing the same to restore an original information signal, said digital signal processing apparatus comprising:

time-multiplexing means provided with an input signal;

a first correction signal generation circuit supplied with the output of said time-multiplexing means, in which, by considering a digital signal of one sampling period as an element, and from a group $ comprising a plurality of said elements, each of m (m is a given integer) elements undergo a modulo-2 addition, forming a first correction signal p by use of said elements of said group $ without duplication, for producing a group P of said first correction signal p by similarly using all the elements in said group $ only once;

a first delay device group supplied with the output of said time-multiplexing means, for selecting n (n is a given integer) elements at a time from said group $ without duplication with less than or equal to one element in common with said generation element of said correction signal p;

a second correction signal generation circuit supplied with the output of said first delay device group, for forming a second correction signal q by the modulo-2 addition of said selected elements from said first delay device group, and also similarly producing a group Q comprising said second correction signal q by using all the elements in said group $ only once;

a second delay device group supplied with the outputs of said first and second correction signal generation circuits, for producing L/m (L is a multiple of m and n) first correction signal p and L/n second correction signal q of said groups P and Q, respectively, in response to the outputs of said first and second correction signal generation circuits;

a third delay device group supplied with the output of said first delay device group, for selecting L elements of said group $ excluding said elements forming said first and second correction signals from the output of said first delay device group;

a block signal forming device supplied with the outputs of said second and third delay device groups, for generating an output block signal which is recorded onto a recording medium in the form of a digital signal; and

a restoration circuit supplied with the first and second correction signals together with the generation elements thereof, both of which are reproduced from the recording medium, to restore the generation elements;

said block signal forming device forming the block signal from the outputs of said second and third delay device groups and an error checking signal, in such a manner that the delayed first and second correction signals p and q and their generation elements form mutually different block signals.

4,371,271

ELECTRONIC THERMOMETER

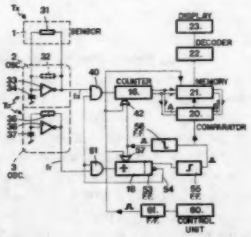
Jean-Marie Bellet, Geneva, Switzerland, assignor to Bioself International Inc., Nassau, The Bahamas

Filed Jun. 4, 1980, Ser. No. 156,447

Claims priority, application Switzerland, Jun. 7, 1979, 5337/79

Int. Cl.³ G01K *07/22*

U.S. Cl. 374—183 **5 Claims**

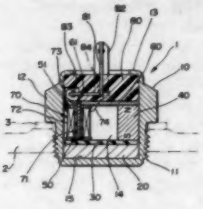


1. An electronic thermometer comprising: a temperature sensor comprising a remotely located variable resistance element whose resistance value varies as a function of the temperature and adapted to be put in contact with an area the temperature of which is to be measured, a measuring oscillator directly coupled with said variable resistance element and providing a first frequency depending on the value of said resistance, a reference oscillator providing a second, predetermined reference frequency, means for counting the number of cycles of the first frequency, means including divider means for establishing a base equal to a predetermined number of cycles of said reference frequency, means interconnecting said establishing means and said counting means for counting the number of cycles of said first frequency occurring during said predetermined number of cycles of said second frequency, and digital circuit means for providing an indication of the measured temperature in response to the result provided by the counting means, both oscillators being located immediately adjacent one another, so that any ambient temperature or power supply drift fluctuations simultaneously affects the frequencies of the two oscillators in the same fashion, the result of the counting thereby being substantially unaffected by any said drift fluctuations.

4,371,272
THERMODETECTOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,702
Int. Cl.³ G01K *7/38*
U.S. Cl. 374—184 **13 Claims**



1. A thermodetector comprising:
a ferromagnetic member disposed on an object whose temperature is to be measured and having a magnetic characteristic which changes in response to a change in temperature;
means for generating a magnetic field coupling said ferromagnetic member;
a magnetically soft core member thermally isolated from said ferromagnetic member and also coupling the magnetic field generated by said means for generating a magnetic field;
an electric coil wound around said magnetically soft core member;
wherein a magnetic circuit is formed, including at least said means for generating a magnetic field, said ferromagnetic member and said magnetically soft core member;
detector means for detecting a change of intensity of magnetic flux produced in said core member by the magnetic field of said permanent magnet means in response to a thermally induced change in the magnetic characteristic of said ferromagnetic member, comprising,
means for applying a pulse voltage to said at least one coil, and
means for measuring the time delay occurring from the application of said pulse voltage until saturation of said core means;
wherein a change in temperature causes a change in said magnetic characteristic of said ferromagnetic member which in turn causes a change in the amount of flux coupling said core member which is detected by said detector means.

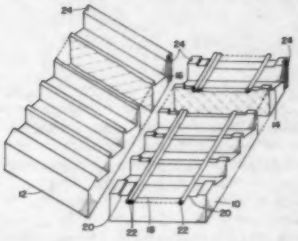
4,371,273
ELECTROCHEMICAL PRINTHEAD

Arthur H. Kendall, Franklin Lakes, N.J.; Joseph W. Mitchell, Montrose, and Carlos J. Sambucetti, Croton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,688
Int. Cl.³ B41J *3/12, 3/20*
U.S. Cl. 400—119 **22 Claims**

1. An electrochromic printhead for an elecctrochromic printing arrangement in which electrical pulses are selectively applied to active electrodes spaced in a printing array while a paper coated with a superficial aqueous conductive liquid is passed therebeneath, comprising:
a. a printhead housing having an array of spaced, precisely positioned, small cylindrical apertures therethrough fabricated from an array of small hollow glass tubes positioned side by side relative to each other, to define a printing array along a printing surface of the printhead housing extending substantially perpendicular to the cylindrical axes of said apertures;
b. each cylindrical aperture having a conductor therein forming one active electrode for actuation of the electrochemical printer, each conductor being sealed relative to its cylindrical aperture in the hollow glass tube such that the superficial aqueous conductive liquid is prevented from flowing or entering therein; and
c. at least one additional conductor, defining a reference electrode, extending to said printing surface, whereby a voltage may be applied between selected active electrodes and said at least one reference electrode to define a printing pattern at said surface.

12. A method of fabricating an electrochromic printhead used in an electrochromic printing method in which electrical pulses are selectively applied to active electrodes spaced in a printing array while a paper coated with a superficial aqueous conductive liquid is passed therebeneath, comprising:



a. forming a printhead housing with an array of spaced, precisely positioned, small cylindrical apertures therethrough from an array of small hollow glass tubes positioned side by side relative to each other, to define a printing array along a printing surface of the printhead housing extending substantially perpendicular to the cylindrical axes of said apertures;
b. placing a conductor within each cylindrical aperture with the conductor being sealed relative to its cylindrical aperture to form one active electrode for actuation of the electrochemical printer, with the sealed conductor in the cylindrical aperture preventing the superficial aqueous conductive liquid from entering therein; and
c. placing at least one additional conductor, defining a reference electrode, at said printing surface, whereby a voltage may be applied between selected active electrodes and said at least one reference electrode to define a printing pattern at said surface.

4,371,274
APPARATUS FOR DOT-MATRIX PRINTING WITH PROPORTIONAL CHARACTER SPACING

Klaus Jaeger, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

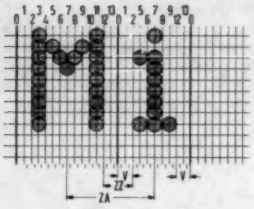
Filed Sep. 29, 1980, Ser. No. 191,401
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942058
Int. Cl.³ B41J *3/12, 19/58*
U.S. Cl. 400—121 **4 Claims**

1. An apparatus for dot-matrix printing of characters for use with an input device and an incrementally advanceable printer carriage comprising:
a character generator in which said characters are stored in binary bit form in respective matrices of columns and rows, said matrices being of equal size regardless of the actual width of characters stored therein such that a plurality of columns in a number of said matrices are unoccupied by character bits, one incremental advance of said

printer carriage normally corresponding to one column in the storage matrix of a character to be printed;

a character control unit connected to said input device and to said character generator, said character control unit operable in a fixed character spacing state and a proportional character spacing state depending upon the type of character to be printed as received from said input device; and

a printer control unit connected to said character control unit for controlling the incremental advancement of said printer carriage, said printer control unit operable, when



said character control unit is in said proportional character spacing state, for initially advancing said printer carriage by a first fixed number of increments, inhibiting advancement of said printer carriage until an occupied column in said storage matrix, advancing said printer carriage in single-column increments for columns in the storage matrix of a character to be printed which are occupied by a character bit, and for advancing said printer carriage a second fixed number of increments for the total number of unoccupied columns remaining in the respective storage matrix for a character.

4,371,275

SELECTOR SYSTEM FOR A SINGLE TYPE CARRIER IN TYPEWRITERS AND SIMILAR PRINTING MACHINES

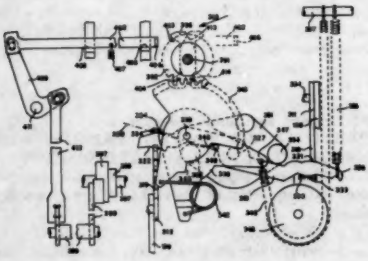
Walter Albrile, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed May 12, 1981, Ser. No. 263,100

Claims priority, application Italy, Dec. 28, 1979, 69487 A/79

Int. Cl.³ B41J *1/60*

U.S. Cl. 400—161.3 **14 Claims**



1. In a selector system for a type carrier of a typewriter comprising a support, an intermediate lever pivoted on the support and operatively connected with the type carrier for the selection of a character of the type carrier and two groups of stop members selectively settable in dependence on the character to be selected, the combination comprising:

a substantially rectilinear selector lever having a longitudinal axis and including a central zone and two stop and fulcrum shoulders lying on opposite zones of said longitudinal axis with respect to said central zone, wherein each of said two shoulders is cooperative with an associated group of said two groups of settable stop members and wherein a set stop member of said group lies at a different distance from the associated shoulder;

means pivoting the central zone of said selector lever on said intermediate lever for causing the typing member to select a different character in response to a variable displacement of said central zone;

driving spring means for rotating said selector lever with respect to said intermediate lever according to a predetermined sense of rotation;

a forked member having two arms substantially symmetrical with respect to the central zone of the selector lever and operable to hold the selector lever in a rest position against the action of said driving spring means;

means for releasing said forked member for causing the selector lever to be operated by said driving spring means up to the arrest of one of said stop and fulcrum shoulders against a set stop member, with following displacement of said central zone and selection of the desired character, wherein a set stop member of one group of stop members causes a rotation of the intermediate lever along one sense of rotation and the set stop member of the other group of stop members causes a rotation of the intermediate lever along another sense of rotation opposed to said one sense of rotation; and

means restoring the forked member for causing the selector lever and the intermediate lever to return to said rest position on completion of the typing of the selected character.

4,371,276

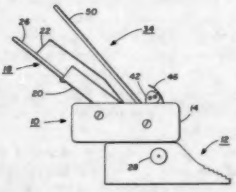
SHEET STACKING OUTPUT TRAY

Svetislav Mitrovich, Dallas, and Ronald L. Beaty, Alvarado, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1980, Ser. No. 174,301

Int. Cl.³ B65H *29/58*

U.S. Cl. 400—625 **5 Claims**



1. In a cut sheet feeding apparatus for use with an independently operable printing machine and having an input tray for storing a plurality of sheet members, sheet feeding means for feeding sheet members in singular sequence from said input tray to said printing machine, the improvement comprising:

feed rollers operatively positioned to receive sheet members in singular sequence from said printing machine and feed said sheet members upwardly in a vertical direction;

an output tray operatively positionable in either of a first or a second position to receive said sheet members from said feed rollers;

deflection means attached to said output tray to deflect the vertically moving sheet members toward said output tray after passing through said feed rollers; and

mounting means to operatively position said output tray in either of a first or a second position, whereby the output tray, when in a first position, receives sheets in a stacked sequence in the same order that the sheets were in when in the input tray, and, when in the second position, receives sheets in a stacked sequence in the reverse order that the sheets were in when in the input tray.

4,371,277

AUTOMATIC PENCIL

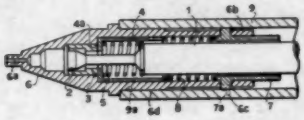
Hidehei Kageyama, and Takahiko Suzuki, both of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Saitama, Japan

Filed Jun. 2, 1981, Ser. No. 269,760

Claims priority, application Japan, Jul. 25, 1980, 55-105958[U]; Mar. 19, 1981, 56-38405[U]; Mar. 19, 1981, 56-38408[U]

Int. Cl.³ B53K 21/02

U.S. Cl. 401—54 7 Claims



1. An automatic pencil comprising:

(a) an outer tube adapted to be gripped by the user;

(b) an end cap, said end cap being assembled in engagement with said outer tube by inserting the backward end of said end cap into said outer tube;

(c) a lead holding and pushing-out mechanism disposed within said outer tube, said mechanism comprising a lead container, a lead chuck secured to said container, a chuck ring externally fitted onto said lead chuck, and a spring disposed in said end cap and engaging said container;

(d) a stopper disposed within said outer tube and engaging said end cap;

(e) said end cap having a plurality of circumferentially displaced openings therein near the open end of said end cap and said stopper having projections on the outer periphery thereof engaging said openings in said end cap; and

(f) a resilient element engaging said stopper and said lead holding and pushing-out mechanism for cushioning pressure applied to the lead.

4,371,278

MUSICAL PEN

Hong K. Joo, 1035-5, Nonhyun-dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Feb. 20, 1981, Ser. No. 236,589

Claims priority, application Rep. of Korea, Jun. 7, 1980, 1980/3636

Int. Cl.³ B43K 29/00; G10D 11/00; A63H 5/00

U.S. Cl. 401—195 7 Claims

1. A musical pen comprising

(A) a barrel having a pair of opposed end openings and a plurality of longitudinally aligned side openings along the length thereof;

(B) a pipe at least partially disposed within said barrel, said pipe defining an aperture therethrough providing communication between the upper of said end openings and said plurality of side openings;

(C) a resilient strip secured to the top of said pipe, extending at least partially across said aperture and adapted to vibrate with the passage of varying levels of air through said aperture; and

(D) means for writing at least partially disposed within said barrel and adapted to extend partially through the lower of said end openings.

4,371,279

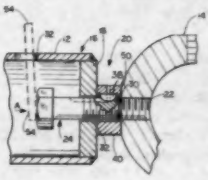
STRUCTURAL JOINT

John Prussen, 1971 Horatio Ave., Merrick, N.Y. 11566, and Paul Gossen, 333 West End Ave., New York, N.Y. 10023

Filed Sep. 22, 1980, Ser. No. 189,175

Int. Cl.³ B25G 3/00; F16D 1/00; F16G 11/00

U.S. Cl. 403—8 11 Claims



1. A structural joint for a space frame comprising a connecting member having a threaded opening therein; a structural member having at least one hollow end portion including an aperture formed in said end portion, a connecting bolt having a head located in said hollow end portion of the structural member and a shank extending through said aperture, said shank having a free end and being threaded over a major portion of its length between said head and said free end, said shank further having a longitudinally extending keyway formed therein and extending through at least part of the threaded portion thereof, a key received in said slot, and a nut engaged with said bolt shank on the exterior of said structural member, said nut having an unthreaded circular aperture formed therein receiving said shank and an internal keyway formed on the inner surface of the aperture receiving a portion of said key, and said key being slidable in both said keyways whereby said nut may be rotated to rotate said bolt and engage the shank thereof in the threaded opening of said connecting member.

4,371,280

SHACKLE ASSEMBLY FOR MOTOR VEHICLE COMPRESSION STRUTS

Günther Handke, Euerbach, and Hans Hepp, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,720

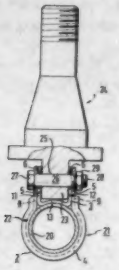
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932138

Int. Cl.³ F16B 2/08

U.S. Cl. 403—13 18 Claims

1. A shackle assembly for fastening compression struts at steering knuckles in the wheel suspension of a motor vehicle comprising: an outer enveloping strap; an inner counter strap; said straps being arranged together to define a compression strut span within which a compression strut may be received; means defining holes adapted to receive therein fastening screws extending through both said inner and said outer straps, said holes being located in portions of said straps other than the

portions thereof defining said compression strut span; said holes defined through said dinner counter strap being formed



with a larger diameter than the holes defined through said outer enveloping strap.

4,371,281

ROD CLAMP

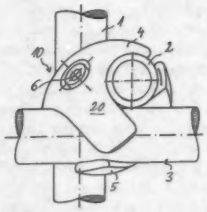
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellosa, Sweden

Filed Mar. 25, 1981, Ser. No. 247,597

Claims priority, application Sweden, Mar. 31, 1980, 8002442

Int. Cl.³ F16D *1/00, 3/00*

U.S. Cl. 403—219 **11 Claims**



1. A clamp for releasably connecting a plurality of elongate members comprising two half portions and securing means for mutually securing said half portions, each half portion comprising an inner face with a central region on which central region an annular collar is disposed and through which collar a hole for said means is provided, and a plurality of lobes extending from said central region said lobes being provided with lands which cooperate in use of the clamp with respective elongate members.

4,371,282

SLEEVE FOR CONNECTING A HANDLE TO A TOOL

Bernd Sturm, Reichelsheim, Fed. Rep. of Germany, assignor to Coronet-Metallwarenfabrik GmbH, Wald-Michelbach, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,897

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2937967

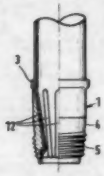
Int. Cl.³ B25G *3/28*

U.S. Cl. 403—277 **13 Claims**

1. A hollow sleeve for connecting a round tubular handle originally configured smooth on one end to a tool comprising:

(a) a conical end part having outside threading for engaging the tool; and

(b) a profiling on the inside face of the sleeve for fixing the end of the handle, the profiling including inward projections arranged in a star-shape and rising out of the inside face of the sleeve at a distance from the larger edge of the sleeve at a distance from the larger edge of the sleeve to a distance from a smaller bottom edge in a continuous slope until ending to form nosepieces which project out of the inside face of the sleeve,



whereby when the handle is fully inserted into the sleeve, the projections form indentations in the originally smooth end of the handle, and the end of the handle projects into the sleeve beyond the nosepieces and is splayed on its entire periphery against the nosepieces.

4,371,283

PROTECTION CHAMBER

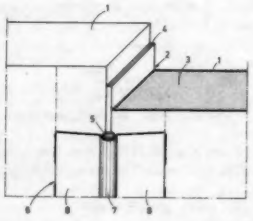
Horst Lampertz, Schmalenbachstrasse 13, D-1000 Berlin 44, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,783

Claims priority, application Fed. Rep. of Germany, May 6, 1980, 3017286

Int. Cl.³ B25G *3/00;* **F16D** *1/00;* **F16G** *11/00*

U.S. Cl. 403—288 **5 Claims**



1. A protection chamber comprising a plurality of protective wall elements with a joint between them, a sealing compound in the joint, and an additional sealing compound at the joint but on the outside of the joint, and a cover strip covering the additional sealing compound.

4,371,284

BARRIER EXTENSION ADAPTER

Gildo Fermeglia, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

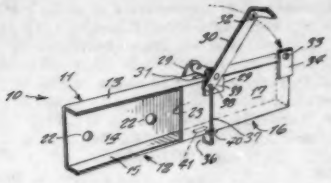
Filed Aug. 15, 1980, Ser. No. 178,506

Int. Cl.³ F16B *3/04, 21/00*

U.S. Cl. 403—301 **3 Claims**

1. A barrier extension adapter, comprising a sleeve with aligned inner and outer ends, in combination with a pivotable arm of a stanchion bolted in said inner end of said sleeve, and an adjustable barrier extension adjustably inserted in said outer end of said sleeve in further combination with spur means for

securement of said extension mounted on said outer end, said spur means including a pivotable latch whereby pivotable movement of said latch to a secured position drives a spur into said barrier extension.



4,371,285

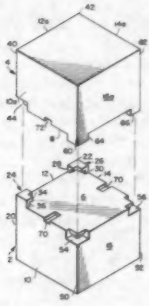
CONNECTION BETWEEN TWO BODIES

Abraham Behar, P.O. Box 848, Catano, P.R. 00632

Filed Feb. 29, 1980, Ser. No. 125,900

Int. Cl.³ F16B *17/00*

U.S. Cl. 403—339 **1 Claim**



1. As a new article of manufacture, a body having a side wall and an end surface and means at and adjacent the end surface for connecting the body to a second body having the same connecting means, the connecting means comprising:

a. at least one inwardly facing hook adjacent the side wall and extending outwardly from the end surface comprising a first part having an outer surface forming an extension of the adjacent side wall and a second part overhanging the end surface and spaced therefrom and providing a recess above the end surface between the two parts, and

b. at least one outwardly facing recess formed in the side wall beneath the end surface at a location spaced from the hook and, defined by a lower surface beneath the end surface and parallel thereto, an inner wall peripendicular to the end wall, and a part overhanging the lower surface with its lower surface spaced above the lower surface of the recess and its outer edge spaced inwardly of the side wall of the body,

c. each hook and each recess having the same size and configuration.

4,371,286

TAPPING BOSS OF MAGNETIC TAPE CASSETTE

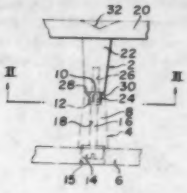
Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 285,291

Int. Cl.³ B25G *3/00*; F16D *2/14*; F16B *21/80*; F16G *11/00*

U.S. Cl. 403—407 **4 Claims**

1. In a tapping boss formed in one piece with the upper half casing for joining the lower half casing of a magnetic tape cassette, an improvement which comprises a stem having a cross sectional area slightly larger than the diameter of a tapping screw to receive the screw and a plurality of ribs which project radially from the cylindrical surface of said stem and whose top portions provide contact shoulders for the boss supporter of a lower half casing.



4,371,287

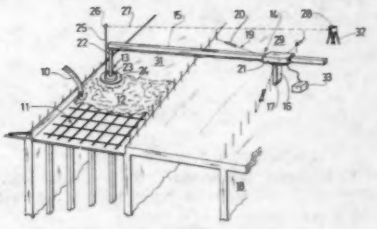
SURFACE TROWELLING DEVICE

Leif Johansson, Bäckvägen 15, Kallered, Sweden (430 50)

Filed Jun. 18, 1980, Ser. No. 160,489

Int. Cl.³ E01C *19/00*

U.S. Cl. 404—84 **8 Claims**



1. A device for trowelling a filling compound upon a substantially horizontal surface, such as a floor, and including an apparatus governed by a level sensing photo-detector adapted to issue a substantially horizontal beam at a predetermined height above said surface, the apparatus comprising

a carrier, mountable outside the surface and having a cantilever arm extensible over the surface,

a vertical pedestal at the distal end of said cantilever arm for carrying a trowelling means, which includes a compound distributor, as well as means for rotating the same about the pedestal,

a mechanism for adjusting said distributor vertically with respect to said pedestal

a measuring rod extending upwardly from said trowelling means, and carrying a receiver for the beam issued by said photo-detector, and

means for transferring changes in the relative position between said receiver at the measuring rod and said photo-detector beam into signals governing the adjusting mechanism.

4,371,288

FLUID IMPERMEABLE LINER FOR A CAVITY IN THE EARTH

Bruno Borca, and Emilio Ruscelli, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 19, 1980, Ser. No. 131,823

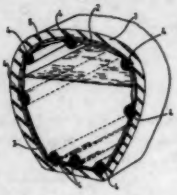
Claims priority, application Italy, Mar. 27, 1979, 21304 A/79

Int. Cl.³ B65G *3/00*

U.S. Cl. 405—53 **8 Claims**

1. A flexible, inextensible, fluid impervious lining member

sealing a cavity in the earth against flow of fluid relative to the cavity and the surrounding earth which comprises an enclosed hollow plastic member having a flexible, fluid impervious, inextensible wall and means attaching the said wall to the said surrounding earth comprising spaced rigid elongated cylindrical members which extend along the wall of the cavity, anchor members for anchoring the cylindrical members to the wall of



the cavity comprising a series of rigid support members fixed to the cylindrical member and having a base embedded in said surrounding earth, and a jaw member arcuate in cross-section radially movable relative to the said elongated cylindrical member for securing said wall against said elongated cylindrical member to prevent relative movement of the said wall relative to the surrounding earth.

4,371,289

UNDERGROUND ROCK CHUTES

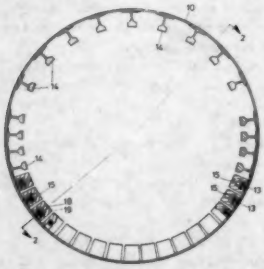
David F. Odendaal, Johannesburg, South Africa, assignor to Gold Fields Mining and Development Limited, Johannesburg, South Africa

Filed Jun. 6, 1980, Ser. No. 157,923

Claims priority, application South Africa, Jun. 12, 1979, 79/2899

Int. Cl.³ E21D *11/00*

U.S. Cl. 405—150 **4 Claims**



1. A cylindrical section for lining a rock pass, said cylindrical section being intended for coaxial mounting with a plurality of similar sections and having inwardly directed means for receiving and retaining liner means, liner means, said receiving and retaining means comprising fixed enlarged headed cleats extending inwardly from the cylindrical section, complementary fastener means for permitting the liner means to slide on and interlock with said cleats, in such manner that said liner means presents a substantially flush inwardly directed surface and whereby said liner means may be replaced from within the cylindrical section.

4,371,290

SHUTTERING FOR ESTABLISHING CONCRETE LINING OF TUNNELS

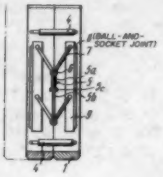
Valentin A. Ivanov, ulitsa Konstantinova, 4, kv. 25; Vladimir A. Khodosh, M.Pirogovskaya ulitsa, 27, korpus 1, kv. 11; Mikhail Y. Shenkman, Otkrytoe shosse, 24, korpus 5g, kv. 37; Vladimir L. Kirbatov, Planetnaya, 26, kv. 43, all of Moscow, and Iosif D. Fishman, ulitsa Maskinostroitelei, 13, kv. 20, Yasinovataya Donetskoi oblasti, all of U.S.S.R.

Filed May 7, 1980, Ser. No. 147,097

Claims priority, application U.S.S.R., May 17, 1979, 2765960

Int. Cl.³ E21D *11/00*

U.S. Cl. 405—150 **4 Claims**



1. A shutter assembly for facilitating production of poured, concrete linings, comprising:

a plurality of shutter sections disposed in adjacent, essentially side-by-side relation, each of said shutter sections including at least a base segment and a wall segment;

hinge means for connecting said base and said wall segments in pivotal relation with respect to each other to thereby form an assembled shutter section, and preventing means connected between two adjacent shutter sections for preventing the sections from being mutually inclined in a vertical plane and for permitting relative step-by-step movement of one assembled shutter section with respect to the other along a pouring site so that the assembled shutter assembly can negotiate curves, obstacles, and the like, said preventing means comprising a vertical bar, said bar including at least two portions relatively pivotal one-with-respect-to-the-other on a common, longitudinal axis; connecting links mounted in pairs at opposed ends of the vertical bar; and

ball-and socket joints for pivotally connecting said links to the respective shutter sections so that one assembled shutter section being displaced can readily move away from an adjacent shutter section.

4,371,291

UNDERWATER FLOWLINE CONNECTOR

Charles D. Morrill, Bellaire, Tex.; John M. Des Lierres, Rolling Hills, and Louis E. Copeland, Garden Grove, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 973,619, Dec. 27, 1978, Pat. No. 4,329,085. This application Jun. 12, 1980, Ser. No. 158,933

Int. Cl.³ E21B *43/01*

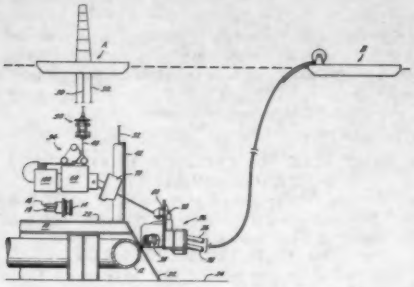
U.S. Cl. 405—169 **36 Claims**

1. An apparatus for pulling a first subsea conduit to a second subsea conduit and for aligning the first subsea conduit with the second subsea conduit, comprising:

pulling means disposed on the subsea floor for pulling the first subsea conduit to the second subsea conduit;

cable means attached to the first subsea conduit and extending to said pulling means, said pulling means being actuated into engagement with said cable means at its location

on the subsea floor for applying pulling force on said cable means at such location; and



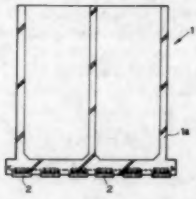
alignment means disposed adjacent to the second subsea conduit for aligning the first subsea conduit with the second subsea conduit.

4,371,292

GRAVITY STRUCTURE

Munetoshi Takahashi, and Takashi Kato, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meiji Gomu Kasei, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,629
Claims priority, application Japan, Jul. 2, 1979, 54-83827
Int. Cl.³ E02D *5/74;* E02B *3/06*
U.S. Cl. 405—224 2 Claims



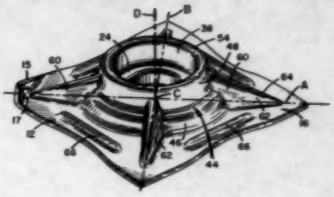
1. A concrete body gravity structure for resting bottom downwards on a surface of a foundation under water including a concrete body having a bottom surface; a plurality of unit friction members each being composed of a rubber block having a flat bottom surface and each having at least one fixing member partially embedded therein, said unit friction members being embedded intgrally in the concrete body with a portion of each member protruding from the bottom surface thereof; and a plurality of reinforcing bars embedded in said concrete body passing through said fixing members; the bottom surface of said unit friction members being caused to contact with the surface of the foundation thereby increasing the co-efficient of friction between the surface of the foundation and the bottom surface of the concrete body underwater.

4,371,293

MINE ROOF BEARING PLATE

Raymond J. Wilcox, 201 Ocean Ave., Santa Monica, Calif. 90402, and Earl W. Powers, 502 Berland Way, Chula Vista, Calif. 92011

Continuation of Ser. No. 945,490, Sep. 25, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 177,854
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—259 33 Claims



1. A bearing plate for supporting a portion of a mine roof or similar surface, said bearing plate comprising:

roof-bearing means including a substantially planar roof-bearing surface for supporting said portion of said mine roof;

bolt-head bearing means including a substantially planar, circumferential bolt-head bearing surface that terminates in a perimeter, said bolt-head bearing surface being concentric about an axis that is perpendicular to said planar roof-bearing surface, said bolt-head bearing surface having an aperture adapted to receive a roof bolt having a bolt head, said aperture being concentric about said axis;

a wall disposed completely around said perimeter of said bolt-head bearing surface and being oriented normal to said roof-bearing surface, said wall extending away from said bolt-head bearing surface to define a cylindrical portion having a distal end spaced from said bolt-head bearing surface;

means for connecting said cylindrical portion to said perimeter of said bolt-head bearing surface; and

reinforcing means connecting the distal end of said cylindrical portion with said roof-bearing means for translating a bearing force applied to said bolt-head bearing means by said bolt-head to said bearing surface for supporting said portion of said mine roof.

4,371,294

SLURRY CONVEYOR SYSTEM

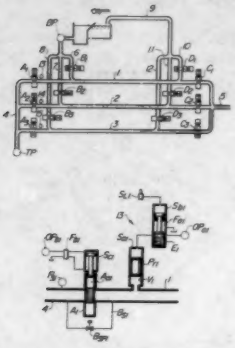
Masakatsu Sakamoto, Matsudo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,002
Claims priority, application Japan, Feb. 8, 1980, 55/13714
Int. Cl.³ B65G *53/30*
U.S. Cl. 406—109 4 Claims

1. In a slurry conveyor system using pressurized water, having a plurality of supply pipes arranged in parallel relation, valves disposed in said supply pipes, a low-pressure mixture pump adapted to charge mixture liquid into said supply pipes, and a high-pressure fresh water pump adapted to force the mixture liquid in said supply pipes into a convey pipe,

an improvement which comprises a pressure adjusting means in each supply pipe for varying the volume within the supply pipes to increase or decrease the pressure in

said supply pipes to equalize said pressure to the pressure in a pipe connected to each of said supply pipes before



opening a valve disposed between each of said supply pipes and said pipe connected to each of said supply pipes.

4,371,295

SYSTEM FOR SPRAYING POWDER

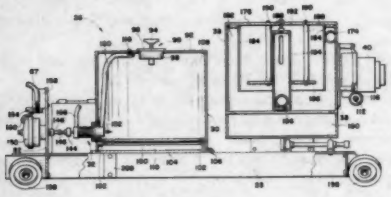
Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Division of Ser. No. 177,086, Aug. 11, 1980, Pat. No. 4,308,819. This application Mar. 19, 1981, Ser. No. 245,454

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—128 **2 Claims**



1. An improved system for spraying fluidized powder comprising a powder dispenser, a powder fluidization chamber including a hollow container adapted to contain a quantity of powder therein, means for sealing said chamber, means for introducing a stream of air into said chamber to fluidize the powder therein, a powder blower having an outlet from which a stream of air is allowed to pass, a powder control valve connected to said chamber and in communication with said fluidized powder therein, means for actuating said powder control valve wherein a quantity of fluidized powder is exhausted into an orifice in said powder control valve, means for introducing the exhausted fluidized powder from said powder control valve into the side of said outlet from said powder blower, a supply conduit connecting said outlet with a portion of said powder dispenser for supplying a stream of fluidized powder to said powder dispensing device, and a fluidization blower having its suction from the atmosphere and from which a stream of fluidizing air is allowed to pass into said chamber, said powder control valve comprising a powder valve body partially extending into said chamber, said powder valve body having a fixed valve seat internal of said chamber and being threadly received within a cylinder, said cylinder being external of said chamber and having a piston slidably received therein, a compression spring surrounding said cylinder and said piston, a cone-shaped poppet having its tapered end received into an orifice within said valve seat, and a horizontally disposed piston rod received on said poppet and extending through said powder valve body and being threadly received in said piston whereby said piston rod is adapted to extend into said chamber when the spring is compressed, thus unseating said poppet from the valve seat orifice thereby allowing a quantity of fluidized powder to be exhausted into the powder valve.

4,371,296

CUTTING TOOL FOR INTERNAL AND EXTERNAL TURNING OPERATIONS

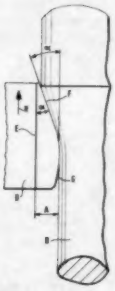
Garri Berstein, Erkelenz, and Walter Riedel, Wegberg, both of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 196,251

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941203

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—115 **2 Claims**



1. A cutting tool for internal and external turning operations, comprising a tool body, a substantially straight main cutting edge on said tool body, a curved auxiliary cutting edge on said tool body adjacent said main cutting edge in such position that the main cutting edge forms a tangent to the curved auxiliary cutting edge, and chip guiding shoulder means on said tool body operatively arranged to enclose an angle with said main cutting edge, said angle being within the range of 3° to 9°, and wherein said chip guiding shoulder means extend in parallel to the feed advance direction of the tool, whereby said angle within the range of 3° to 9° is also enclosed between said main cutting edge and the feed advance direction.

4,371,297

MACHINE TOOL

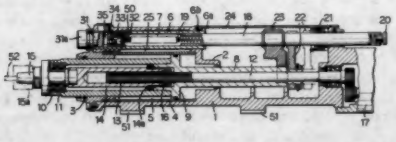
Noboru Hirose, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 23, 1980, Ser. No. 190,069

Claims priority, application Japan, Oct. 3, 1979, 54-136849[U]

Int. Cl.³ B23B *45/04, 47/22*; F15B *5/00*

U.S. Cl. 408—130 **4 Claims**



1. A machine tool having:

a machine frame adapted to be attached to a stand,
a quill reciprocably mounted on the machine frame,
a spindle rotatably mounted in the quill and carrying a tool at one end thereof,
a motor operatively connected with the spindle for rotating the same,
pneumatic feed means for reciprocating the quill in advancing and returning directions, and
feed control means for controlling the feed speed of the quill, including:
(a) an hydraulic cylinder which is disposed in parallel with the quill and provided with a housing confining a cylinder chamber therein and a piston assembly disposed within the housing having a portion projecting from one end of the housing,
(b) a liquid tank formed on the machine frame, along the axis of the spindle,
(c) means for connecting the liquid tank to the hydraulic cylinder,
(d) regulating means disposed in the connecting means for regulating flow of liquid from the hydraulic cylinder to the liquid tank and allowing free flow of the liquid from the liquid tank to the hydraulic cylinder, and
(e) engaging means for engaging the quill with the projecting portion of the piston assembly when the quill arrives at a desired position in the forward movement thereof, whereby the quill is moved at a rapid speed by the pneumatic feed means until it engages with the projecting portion and then is moved at a slow speed controlled by the regulating means,
wherein the improvement comprises;
the connecting means including two passages, each having at one end thereof a first opening associated with the liquid tank, and at the other end thereof a second opening associated with the cylinder chamber, one of the first openings of the passages being open to one axial end portion of the liquid tank, and the other of the first openings being open to the other axial end portion of said liquid tank,
selecting means for selectively communicating the cylinder chamber with one of the second openings of the passages and blocking the other of the second openings, whereby the selection of either one of the two second openings causes the liquid tank to be communicated with the cylinder chamber via one of the first openings corresponding to the selected second opening, thereby enabling the machine tool to be used in any posture with at least one of the first openings maintained below the surface of liquid in the tank.

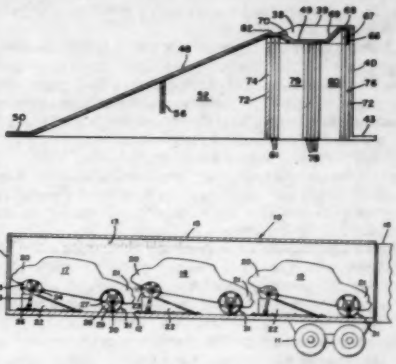
4,371,298

VEHICLE SUPPORTING RAMPS FOR CARGO CONTAINERS

Willem H. P. Van Iperen, Westfield, N.J., assignor to Sea-Land Industries, Inc., Elizabeth, N.J.

Filed Apr. 6, 1981, Ser. No. 251,314
Int. Cl.³ B60P *3/007, 7/008;* **B32B** *1/000*
U.S. Cl. 410—25 **4 Claims**

1. A knockdown disposable vehicle supporting ramp for mounting on the floor of a container for elevating the rear end of a vehicle having wheels thereon for nesting in-line with another similarly elevated vehicle comprising; a ramp assembly having a U-shaped cross-sectional configuration, said ramp assembly having vertical side and rear walls connected to each other, said side walls each having an inclined ramp section and a wheel positioning section, said ramp section having downwardly inclined edges in said side walls extending from said wheel positioning section to the container floor, said ramp assembly being constructed of corrugated fiberboard having load-supporting vertically-extending corrugations, a longitudinally-extending wheel guide ramp and wheel well mounted on said ramp assembly, said wheel guide ramp being supported on said inclined edges of said ramp section and said wheel well being positioned in said wheel positioning section, reinforcing ramp supporting means mounted between said side walls for supporting a load on said wheel guide ramp, said wheel guide ramp having a lower end and an upper end, means securing said lower end of said wheel guide ramp to the container floor, means for retaining said upper end in said wheel positioning section for receiving and supporting a vehicle wheel on said wheel well, a four-sided liner cooperatively receivable in said wheel positioning section for supporting a load including reinforced cardboard having vertically extending corrugations, a back stop corrugated fiberboard member having vertical corrugations spaced from said rear wall in said wheel positioning section forming an opening for cooperatively receiving therein a portion of said wheel well, and a plurality of spaced reinforced plies of corrugated fiberboard having vertically-extending corrugations for supporting a load within said four-sided liner to which the wheel well is subjected.

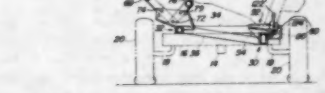


4,371,299

TRAILER FRAME

Darryl F. Cain, East Moline, Ill., and Kevin L. Ehrecke, Blue Grass, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 24, 1980, Ser. No. 171,858
Int. Cl.³ B60P *3/00, 7/08;* **B61D** *3/16, 45/00*
U.S. Cl. 410—44 **16 Claims**



1. A towable transporter for endwise transport of a laterally elongated harvesting header having at least two rearward downwardly facing spaced-apart support surfaces comprising:
a towable undercarriage having at least two wheels for supporting the undercarriage above the ground and including spaced-apart front and rear generally laterally and horizontally extending bolsters;
an elongated longitudinally extending frame spanning the bolsters and supported by them and having opposite first and second lateral sides extending generally longitudinally of the undercarriage;
first header support means, having first localized fixed support surfaces carried by the frame adjacent the first lateral side;

an elongated longitudinally extending movable header support member providing longitudinally extending and aligned support surfaces and fixed pivot means for connecting the member to the frame adjacent the second lateral side so that the support surfaces are shiftable in a range of laterally spaced positions, said range overlying the pivot means and each position providing, in cooperation with the first support means, a particular combination of support surfaces for receiving and stably supporting a particular header; and

means for positioning and retaining the frame on the bolsters.

12. An adapter arrangement, for use in cooperation with a wagon running gear having spaced-apart front and rear bolsters, for supporting and transporting a harvesting header having spaced-apart front and rear undersurfaces comprising:

a main frame having laterally spaced and laterally interconnected first and second longitudinal members, for spanning and being supported by the bolsters;

means for releasably securing the main frame to the bolsters;

a plurality of fixed spaced support members for engaging the rear undersurfaces of the header, carried by the frame adjacent the first longitudinal member;

a sub-frame having support surfaces and fixed pivot means for connecting the sub-frame to the main frame so that the support surfaces are laterally displaceable so as to provide a plurality of positions of the support surfaces for engaging forward undersurfaces of a header; and

means for retaining the sub-frame in a predetermined position relative to the main frame for selectively engaging a particular portion of the forward undersurfaces of a particular header.

4,371,300

INSERT

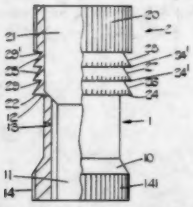
Stanley A. Ringham, Ilford, England, assignor to Adbar (Patent Co.) Limited, Warwickshire, England

Filed Jan. 23, 1981, Ser. No. 227,928

Claims priority, application United Kingdom, Jan. 26, 1980, 8002720

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—41 **10 Claims**



1. An insert of the character described for installation in a hole therefor in parent material comprising a round section body member of which at least part of the exterior of said body member has an increase in diameter between larger and smaller diameter ends thereof, said body member being such as to end locate by its larger diameter end in a hole therefor in parent material; and a tubular ferrule adapted to be axially driven about the exterior of the body member when the latter is end located by its larger diameter end in a said hole therefor, the exterior of the ferrule being annularly grooved to provide at least one forwardly directed portion from said groove at the leading end of the ferrule and having a thin section connection therewith at the annular groove whereby on the ferrule being axially driven about the exterior of the body member and co-acting with the latter at the increase in exterior diameter thereof, the forwardly directed portion effects a radial expanding action of the ferrule into taper engagement with the wall of a said hole receiving the insert in order to lock the ferrule and body member in the hole with a taper locking action against axial pullout of the insert from the hole.

4,371,301

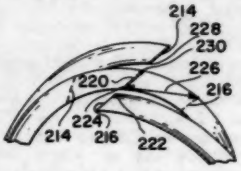
MODIFIED SPIRAL WOUND RETAINING RING

Ashby G. Lawson, Tabb, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 29, 1980, Ser. No. 182,880

Int. Cl.³ F16B *21/18*

U.S. Cl. 411—517 **5 Claims**



1. A spiral wound retaining ring comprising:

a spiral wound ring;

said ring having ends thereof angled within a plane parallel to the upper and lower surfaces of the ring with respect to a radial line emerging from the center of said ring, both of said ends being angled to the same degree and in the same direction; and

said ring having a crimp oriented on the ring between said angled ends.

4,371,302

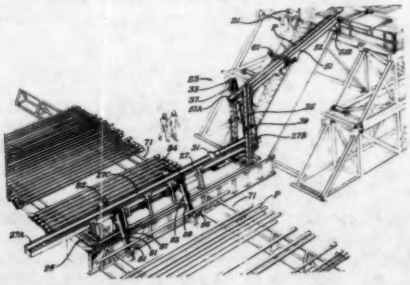
PIPE HANDLING APPARATUS

Robert Frias, Odessa; C. W. Minnis, Fort Worth; A. Hubert Hawkins, Fort Worth, and Wendell Davis, Fort Worth, all of Tex., assignors to Ingram Corporation, New Orleans, La.

Filed Sep. 30, 1980, Ser. No. 192,495

Int. Cl.³ E21B *19/14*

U.S. Cl. 414—22 **8 Claims**



1. An apparatus for transferring pipe or the like to and from the floor of a drilling rig comprising:

an elongated support frame adapted to be located below the level of the floor of the rig with one end extending toward the rig and located relatively close to the rig,

an elongated stationary trough means supported by said support frame for receiving and supporting pipe,

said stationary trough means having a first end and an opposite second end,

said second end of said stationary trough means being located relatively close to the rig,

a support means located at said second end of said stationary trough means,

a movable trough means for receiving and supporting pipe, said movable trough means being aligned with said stationary trough means and having a first end coupled to said support means for generally vertical movement between a lower position and an upper position,

said lower position being next to and above said second end of said stationary trough means and said upper position being at a level above and spaced from said second end of said stationary trough means,

the opposite end of said movable trough means being adapted to be supported by structure at the floor of the rig,

a movable means supported for movement along the length of said elongated stationary trough means for moving pipe lengthwise along said elongated stationary trough means to its second end and up onto said movable trough means when said first end of said movable trough means is in said lower position for facilitating transfer to the floor of the rig and for allowing pipe to slide down said movable through means onto said stationary trough means when said movable trough means is in said lower position,

a first end moving means operatively connected to said first end of said movable trough means for moving said first end between said lower and upper positions, and

a clamping means for clamping pipe to said movable trough means as said first end moving means moves said first end between said lower and upper positions, said clamping means allowing pipe to be moved between said movable trough means and said drilling rig floor when said first end is in said upper position and between said movable trough means and said stationary trough means when said first end is in said lower position.

4,371,303

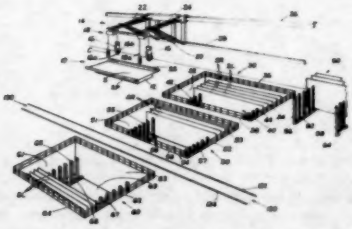
RAILWAY CAR FABRICATION FACILITY

Eldred N. Fritzsche, Kirkwood; Edgar F. Josephson, St. Charles, both of Mo., and Frank C. Pulcrano, Huntington, W. Va., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 19, 1980, Ser. No. 218,147

Int. Cl.³ B65G 63/02

U.S. Cl. 414—281 **12 Claims**



1. A railway car fabrication facility for transporting railway car sides within the facility to a railway car assembly position so that the sides can be assembled into rail cars without necessitating rotation of the railway car sides during transportation to the car assembly position comprising: means for supporting right hand and left hand railway car sides having a bulbous portion and a flat portion in an above ground side assembly position; a below ground transfer area spaced from said side assembly position along a first path; a first below ground storage area for right hand sides spaced from said transfer area along a second path extending laterally from said first path; a second below ground storage area for left hand sides spaced from said first below ground storage area; first longitudinally movable crane means, movable along said first path, for picking up the sides from said side assembly position and placing them into said below ground transfer area; second laterally movable crane means movable along said second path for picking up at least the left hand sides from said below ground transfer area and placing them in said second below ground storage area located on an opposite side of a car assembly position wherein the sides are placed in operative position in a railcar.

4,371,304

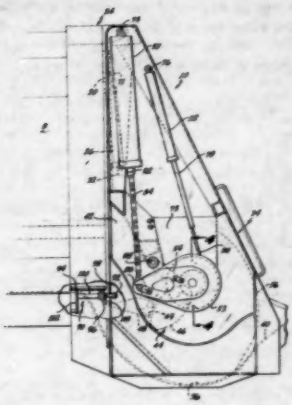
REFUSE COMPACTION APPARATUS AND METHOD

Fred T. Smith, Palos Verdes Peninsula, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 876,644, Mar. 10, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,362

Int. Cl.³ B65F 3/20

U.S. Cl. 414—293 **61 Claims**



1. A refuse compacting apparatus comprising:

a container for storing refuse under pressure,

a loading hopper in communication with said storage container,

refuse compacting means positioned to sweep through said hopper to compact refuse therein and to move compacted refuse from the loading hopper into the storage container,

a passage leading from said hopper into said container,

said passage having an enlarged opening into said hopper and an enlarged opening into said container, and

said passage having a narrowed throat positioned intermediate the enlarged openings into said hopper and said container,

said passage being progressively constricted from said enlarged opening into said hopper to the narrowed throat and being enlarged from the narrowed throat to said enlarged opening into said container,

whereby refuse moved from the loading hopper into the storage container through said passage by the action of the refuse compacting means is squeezed and subjected to high localized pressures within said throat as the refuse passes through said narrowed throat and whereby the pressure is released as the refuse moves past the throat to the enlarged opening in the container.

4,371,305

MATERIAL HANDLING APPARATUS

Robert T. Pannell, Crest Line Rd., Kennett Square, Pa. 19348

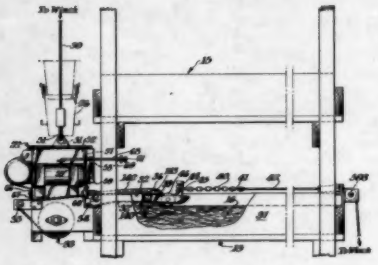
Filed Feb. 21, 1978, Ser. No. 879,903

Int. Cl.³ A01G 1/04; B65G 3/20, 15/28

U.S. Cl. 414—300 **19 Claims**

11. In an apparatus for deposiging particulate material for mushroom growing wherein the particulate material is to be

deposited at a uniform depth upon the surface of an elongated bed, the apparatus including a distributor box mounted near one end of the surface, the distributor box having an elongated discharge opening disposed toward the surface and of a length generally corresponding to the width of the surface, means for feeding the particulate material into the distributor box, a belt mounted at one end to a supply roller and anchored at its other end near the one end of the surface with a portion of the belt rolled around the supply roller, the belt passing through the lower portion of the distributor box and emerging from the distributor box through the discharge opening, means for unwinding the belt from the supply roller and moving it toward the other end of the surface for passing the belt over the surface and with the belt having a movable reversal point as it is moved over the surface and means for rewinding the belt on the supply roller with the movable reversal point thereby moving back toward the one end of the surface whereby particulate material fed into the distributor box is deposited on the belt and carried by the belt toward the other end of the surface as the belt reversal point moves toward the



other end of the surface and the particulate material is then deposited on the surface as the belt reversal point moves toward the other end of the surface, the improvement being said belt forming the bottom of said distributor box at said discharge opening, fixed support means for said belt within said distributor box upstream from said discharge opening, fixed support means for said belt outside of said box downstream from said discharge opening, said belt being unsupported at said discharge opening between said upstream and downstream support means to provide sufficient downward clearance for the downward movement of said belt whereby stones or the like may be discharged through said discharge opening by forcing said belt downward until the portion of said belt supporting the stone or the like is moved away from said discharge opening, and said upstream and downstream support means maintaining said belt tensioned to maintain said belt generally horizontal under the weight of said particulate material to permit only the desired amount of particulate material to pass through said discharge opening while permitting said belt to move downward when a stone or the like passes through said discharge opening.

4,371,306
REFUSE EJECTION APPARATUS
Fred T. Smith, Palos Verdes Peninsula, Calif., assignor to Sargent Industries, Inc., Century City, Calif.
Division of Ser. No. 876,644, Feb. 10, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,441
Int. Cl.³ B65F *3/28*
U.S. Cl. 414—325 **21 Claims**

5. In a refuse compaction apparatus having a container for storing refuse under pressure and means for pressurizing refuse within said container, the improvement comprising:

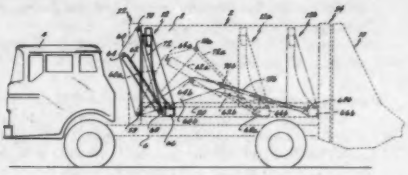
a first rigid frame positioned at one end of said container,

a second rigid frame positioned at the other end of said container,

a plurality of longitudinal rigid members connecting said first and second frames,

a plurality of flexible metal sheet members enclosing the container with the sheet members supported by said first and second frames and said longitudinal rigid members,

said flexible sheet members being bowed outwardly at their points of support,



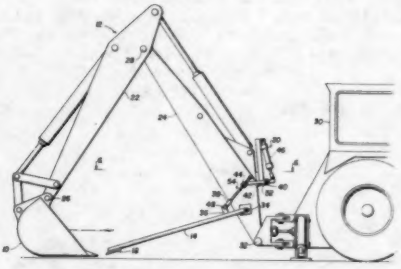
whereby the sheet members are in tension in resisting pressure within said container,

an ejection panel slidably positioned within said container,

the longitudinal rigid members including members extending between the first and second frames adjacent to said base to form slide rails, and

said ejection panel slidingly engaging said slide rails.

4,371,307
HYDRAULIC BUCKET CLEANER
Melvin J. Mattson, 107 W. Johnson Ave., Warren, Minn. 56762
Filed Dec. 10, 1980, Ser. No. 214,820
Int. Cl.³ B66F *9/00*
U.S. Cl. 414—725 **22 Claims**



1. Apparatus for cleaning the interior of a digging bucket pivotally mounted on an articulated boom comprising:

(a) a first segment having a first end on which said bucket is pivotally mounted and a second end remote from said first end and

(b) a second segment having a first end pivotally connected to said first segment at its second end and a second end remote from said first end,

said apparatus comprising:

(c) a first strut having a first end adapted to be pivotally mounted on said second segment of said articulated boom at a point intermediate its first and second ends and a second end remote from said first end;

(d) a scraper mounted on said first strut at its second end; and

(e) first means for selectively pivoting said first strut relative to said articulated boom independently of the motion of said first segment from a carry position in which said first strut is adjacent to said second segment of said articulated boom to a work position in which it is swung away from said second segment and for pivoting said scraper in an arcuate motion to effect cleaning of said bucket.

4,371,308

ARRANGEMENT IN A CABLE WINDING MACHINE

Öystein Skalleberg, Järfälla, Sweden, assignor to Skaltek AB, Kungsangen, Sweden

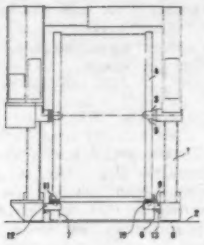
PCT No. PCT/SE80/00031, § 371 Date Oct. 9, 1980, § 102(e) Date Oct. 9, 1980, PCT Pub. No. WO80/01682, PCT Pub. Date Aug. 21, 1980

PCT Filed Feb. 1, 1980, Ser. No. 198,141

Claims priority, application Sweden, Feb. 9, 1979, 7901173

Int. Cl.³ B66F 9/00

U.S. Cl. 414—416 4 Claims



1. An apparatus for use with a cable winding machine for supporting a cable reel and a pallet for the cable reel, said machine comprising:

two vertical support members;

an extensible cross bar interconnecting said support members so that the support members are relatively movable with respect to each other between a support position and a release position;

a spindle supported by and vertically displaceable along each of said support members, the spindles cooperating with each other to carry a cable reel when the support members are in the support position; and

lifting means for carrying a pallet, said lifting means being carried by a lower portion of one of said support members and projecting toward the other of said support members, said lifting means being resiliently suspended from said one of said support members and being movable between a lower position when loaded with a pallet and reel and an upper position when loaded with a pallet only so that the pallet is lifted when the reel is removed from the pallet by vertical displacement of said spindles.

4,371,309

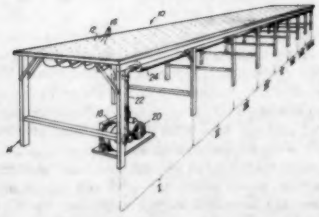
AIR TABLE

William L. Principe, 2594 Weigelia Rd., NE., Atlanta, Ga. 30345, and Jacky L. Fowler, 1991 N. Oak Dr., Lawrenceville, Ga. 30245

Filed Feb. 25, 1981, Ser. No. 237,929

Int. Cl.³ B65G 35/00, 51/02

U.S. Cl. 414—676 3 Claims



1. An improvement in an air table of the type having an article support surface with a plurality of openings therethrough, said surface comprising a plurality of juxtaposed sections along its length, a longitudinally extending air manifold, a source of pressurized air connected to said manifold and an air pipe for each section which laterally extends from said manifold beneath said surface and is in communication with the openings of the respective section, the improvement comprising:

(a) valve means on each of said air pipes operable between open and closed positions to selectively deliver air from said mainfold through said air pipe to said openings; and

(b) means on each of said sections and connected to said valve means thereon for selectively and independently actuating each of said valve means between said open and closed positions, said actuating means being responsive to an article on the respective section so as to maintain said article above said support surface while in transit between said sections, said air pipe including a longitudinally extending passageway defining a path of travel for said pressurized air and wherein said valve means is disposed in said passageway, said valve means being a pinch valve comprising a valve sleeve co-axially positioned in said air pipe and defining a chamber which is in flow communication with said passageway, a diaphragm secured within said chamber, an inlet on said sleeve in communication with said chamber, a source of fluid and a fluid line connecting said fluid source with said inlet whereby said diaphragm is selectively moved between an open position for air flow between said passageway and said chamber and thence to said openings and a constricted position to prevent said air flow, said actuating means including a means of sensing said article on said section and a fluid valve on said fluid line operable between open and closed position, said sensing means being connected to said fluid valve so that when said sensing means is actuated by said article, said fluid valve is moved to said closed position, thereby restricting the flow of fluid between said fluid source and said inlet to cause said diaphragm to move to said open position, and wherein said fluid valve is a slide valve having a valve housing defining a slide chamber, said housing having an intake opening in communication with said source of fluid and an outlet opening in communication with said inlet, a piston spring-biased within said chamber and having a passageway therethrough, said piston being movable from a first, normal position wherein the opposed ends of said passageway are in respective registration with said intake opening and said outlet opening and a second position wherein said opposed ends are out of said registration, and sensing means being connected to said position.

4,371,310

CENTRIFUGAL PUMP RECIRCULATION DIFFUSER

John W. Henry, IV, and David E. Cassel, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 23, 1974, Ser. No. 492,300

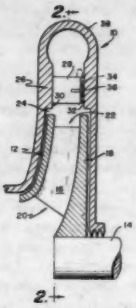
Int. Cl.³ F04D 29/66

U.S. Cl. 415—211 4 Claims

1. A centrifugal pump for liquids having a casing with a vaned impeller rotatably mounted therein and a diffuser section at the periphery thereof comprising:

a pair of facing shroud members forming the diffuser section of the casing;

a plurality of hydrodynamically shaped diffuser vanes attached to at least one of said shrouds; and

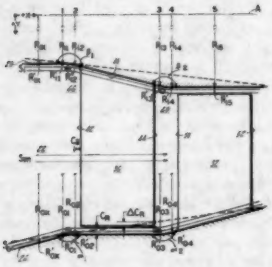


a recirculation flow path around said diffuser vanes from the outside high pressure side to the inside low pressure side of said diffuser vanes.

4,371,311
COMPRESSION SECTION FOR AN AXIAL FLOW ROTARY MACHINE

Thomas C. Walsh, New Britain, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 28, 1980, Ser. No. 144,714
Int. Cl.³ F01D 9/00
U.S. Cl. 415—182 7 Claims



1. A compression section of an axial flow rotary machine of the type having an annular flow path for working medium gases disposed about an engine axis, the working medium gases having streamlines which have in the radial direction a first curvature having a positive mathematical sign with respect to the axis of the engine and a second curvature having a negative mathematical sign with respect to the axis of the engine which comprises:

an outer wall circumscribing the annular flow path, the outer wall having a first geometric contour for causing the streamlines of the flow path adjacent the outer wall to have a curvature in the radial direction having a first mathematical sign with respect to the axis of the engine and having a second geometric contour axially spaced from the first contour of the outer wall for causing the streamlines of the flow path adjacent the outer wall to have a curvature in the radial direction having a second mathematical sign with respect to the axis of the engine;

an inner wall spaced inwardly from the outer wall and bounding the flow path, the inner wall having a first geometric contour for causing the streamlines of the flow path adjacent the inner wall to have a curvature in the radial direction having said first mathematical sign with respect to the axis of the engine and having a second geometric contour axially spaced from the first contour of the inner wall for causing the streamlines of the flow path adjacent the inner wall to have a curvature in the radial direction having said second mathematical sign with respect to the axis of the engine;

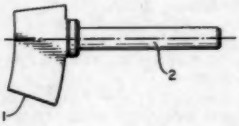
at least one array of rotor blades extending outwardly from the inner wall into proximity with the outer wall and including a plurality of airfoils, each airfoil having a spanwise axis, a first edge region extending spanwisely and a second edge region extending spanwisely;

wherein the first geometric contour of the outer wall and the first geometric contour of the inner wall are in the first edge region of each airfoil and wherein the second geometric contour of the inner wall and the second geometric contour of the outer wall are in the second edge region of the airfoil.

4,371,312
BUCKET FOR AN ADJUSTABLE TURBINE INLET GUIDE BAFFLE SYSTEM

Eggert Tank, Wernau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 248,829
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013076
Int. Cl.³ F01D 1/02; B05D 1/00
U.S. Cl. 415—200 13 Claims



1. A bucket for an adjustable turbine guide baffle system for gas turbines said bucket having a shank which is coated with a layer of slip-providing material by plasma spraying particles of the slip-providing material onto said shank, said particles of slip-providing material consisting essentially of 90–100% by weight of nickel oxide and 0–10% by weight of one or more oxides of chromium, aluminum, zirconium, titanium, iron, manganese, or magnesium.

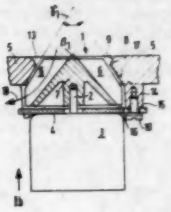
4,371,313
MINIATURE DIAGONAL BLOWER WITH AXIAL FLOW INLET AND RADIAL FLOW OUTLET

Martin Burgbacher; Siegfried Harmsen, and Georg Papst, all of St. Georgen, Fed. Rep. of Germany, assignors to Papst-Motoren K.G., St. Georgen, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,506
Claims priority, application Switzerland, Nov. 8, 1978, 11471/78
Int. Cl.³ F04D 29/42
U.S. Cl. 415—215 14 Claims

1. A miniature diagonal blower with axial inward flow and radial outward flow comprising a drive motor having a shaft stub and a motor housing, said shaft stub being rotatable about a fan axis, a fanwheel including a hub fitted with fan blades, said hub being mounted on the shaft stub of the drive motor for rotation about said fan axis, a fanwheel housing surrounding the fanwheel without contacting said fanwheel and being provided with recesses for the inward flow and outward flow, a flanged surface means associated with the motor housing, said flanged surface means projecting on the outward flow side beyond the fanwheel and being located such that said hub extends axially almost up to said flanged surface means, said fanwheel housing being provided with support legs distributed about the circumference of the fanwheel in the vicinity of the

outward flow, said legs delimiting recesses located between them for the outward flow and being mounted by their soles on said flanged surface means associated with the motor housing



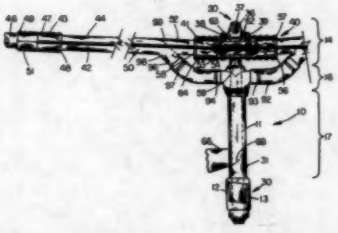
with fastening means, and wherein said fanwheel housing and said motor housing are configured such that said blower has a square cross section in the direction perpendicular to the fan axis and a rectangular cross section along the fan axis.

4,371,314

AIR JET HELICOPTER ROTOR HUB AND AIR DISTRIBUTION SYSTEM

Darold R. Daniel, Pleasonton; Clarence R. Kiesling, Grand Island, and Jerry L. May, Kearney, all of Nebr., assignors to Henderson & Sturm, Omaha, Nebr.

Filed Apr. 6, 1981, Ser. No. 251,608
Int. Cl.³ B64C *27/18*
U.S. Cl. 416—20 A **14 Claims**



1. In an air jet helicopter, having a fuselage, a compressed air source, hollow rotor blades, a rotor hub, pitch control systems, and tension straps, a rotor hub assembly and air distribution system comprising:

a thrust bearing means secured to the fuselage for supporting a rotatable mast shaft in a somewhat vertical orientation, said mast shaft having a lower protruding segment, an upper protruding segment and an exposed segment, and for resisting vertical forces acting upon said mast shaft;

a stationary plenum means attached to the fuselage and surrounding the lower protruding segment of the mast shaft for receiving compressed air from the compressed air source and for the transportation thereof to the hollow rotor blades;

mast shaft air seal means for preventing air pressure loss from the adjoinment of the rotatable mast shaft and the stationary plenum means;

a rotatable plenum means secured to and surrounding the upper protruding segment of the mast shaft for receiving compressed air from the stationary plenum means and for transportation thereof to the hollow rotor blades;

rotatable plenum air seal means for preventing air pressure loss from the adjoinment of the stationary plenum means and the rotatable plenum means;

two flexible duct means each attached at a first end to the rotatable plenum means and at a second end to a hollow rotor blade for transporting compressed air from the rotatable plenum means to the hollow rotor blades and for allowing the hollow rotor blades to tilt and rock with respect to the mast shaft; and

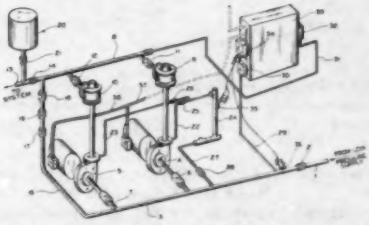
a teetering hinge means connecting the exposed segment of the mast shaft to the rotor hub for allowing the rotor hub to tilt with respect to the mast shaft and for minimizing the load of the tension straps on the pitch control systems.

4,371,315

PRESSURE BOOSTER SYSTEM WITH LOW-FLOW SHUT-DOWN CONTROL

Satoru Shikasho, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,461
Int. Cl.³ F04B *49/00, 49/02*
U.S. Cl. 417—5 **13 Claims**



1. A water pressure booster system comprising: a suction header in fluid communication with a source of water;

a discharge header in fluid communication with a fluid distribution system;

a least one pressure booster pump having a suction inlet coupled to said suction header and a discharge outlet coupled to said discharge header;

control means for energizing and deenergizing said pump;

said control means comprising a temperature header coupled between said pump discharge outlet and said suction header, first means for sensing the fluid temperature in said temperature header, second means for sensing the temperature of fluid supplied to said suction header, differential temperature control means for generating a first control signal when the temperature differential between said first and second sensing means is a predetermined level, and means responsive to said first signal for de-energizing said pump.

4,371,316

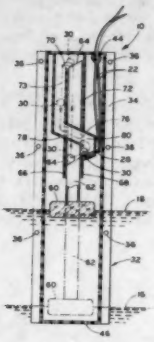
CONTROL FOR A BILGE PUMP

Michael Ivic, P.O. Box 262, Seabrook, Tex. 77586

Filed Mar. 23, 1981, Ser. No. 246,652
Int. Cl.³ F04B *49/04*
U.S. Cl. 417—41 **3 Claims**

1. A control for selectively operating a bilge pump for a boat comprising a float operatively disposed in a bilge area of a boat so as to partake of ascending and descending movements in response to changes in the level of the volume of water existing in said bilge area, an electrically energized motor-operated bilge pump having an electrical circuit with a normally open pair of contacts, a ball of electrically conductive construction material having a first operative position in supported relation atop of said float incident to said ball being carried to an elevated discharge station in response to ascending movement in said float occasioned by an increase in the volume of water in said bilge area, a passage means connected to cause movement of said ball from said discharge station to a second operative position in spanning relation across said normally open contacts so as to initiate pumping operation of said bilge pump and descending movement in said float, and an upstanding extension on said float having a surface in position-holding contact with said ball during said descent of said float,

whereby said bilge pump is maintained in pumping operation for the duration of said contact between said surface and said



ball after which there is ball movement from said second to said first operative position thereof terminating operation of said pump.

4,371,317

HYDRAULIC SYSTEMS

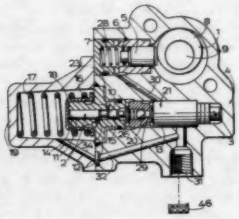
Helmut Heibel, Moschheim, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 9, 1981, Ser. No. 232,687

Claims priority, application United Kingdom, Feb. 16, 1980, 8005303

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—298 **6 Claims**



1. An hydraulic system comprising a tank for hydraulic fluid, an hydraulic accumulator, an hydraulic pump for drawing fluid from said tank and having an output to supply fluid under pressure to charge said accumulator, and an unloader valve disposed in a supply line between said pump and said accumulator and which is operative to prevent said accumulator from being overcharged and to allow said pump to recharge said accumulator should the pressure stored therein fall below a desired minimum value, said unloader valve comprising a housing incorporating an inlet for connection to said pump, an exhaust port for connection to said tank, a control valve, a pressure responsive slave which is operated by fluid pressure under the control of said control valve, a first one-way valve having an inlet, a second valve connected between said inlet of said first one-way valve and said exhaust port and having a valve member, and a complementary seating with which said valve member is engageable, and means defining a control chamber, said control valve comprising a control valve member movable between a first position in which said accumulator is isolated from said slave so that pump pressure can be supplied to said accumulator and a second position in which fluid pressure from said accumulator or said pump can act on said slave to render said slave operative to unload said pump, and spring means for biassing said control valve member into said first position against the control pressure present in said control chamber into which fluid is adapted to be pumped through said first one-way valve, said slave being arranged to open said second valve at a cut-out point so that said output of said pump is returned directly to said tank, and said slave comprising a piston assembly comprising inner and outer concentric piston parts which are relatively movable axially and of which said inner part is engageable with said valve member of said second valve to urge said valve member away from said seating at said cut-out point and said outer piston part is engageable with said inner piston part in a direction to open said second valve, in combination with a stop for arresting movement of said outer piston part in a direction towards said second valve after said valve member has been moved away from said seating, whereafter said inner piston part is movable relative to said outer piston part to urge said valve member further away from said seating.

4,371,318

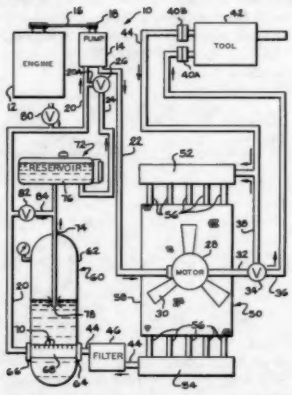
HYDRAULIC FLUID POWER SYSTEM

James A. Kime, 3360 Parkway Center, Columbus, Ohio 43026

Continuation-in-part of Ser. No. 952,299, Oct. 18, 1978, abandoned. This application May 16, 1980, Ser. No. 150,563

Int. Cl.³ F04R *49/02*

U.S. Cl. 417—304 **5 Claims**

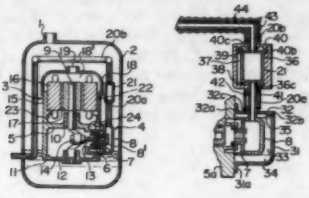


1. A hydraulic system comprising a hydraulic pump, a hydraulic fluid intake conduit in communication with said pump, a hydraulic fluid discharge conduit in communication with said pump, an accumulator containing hydraulic fluid in communication with said intake conduit, supplemental pressurization means in communication with said intake conduit, said supplemental pressurization means including a supplemental reservoir containing reserve hydraulic fluid in communication with said accumulator and said intake conduit, a valve positioned between said supplemental reservoir and said intake conduit wherein said valve opens when the pressure in said intake conduit is below a reference pressure, drawing reserve hydraulic fluid from said supplemental reservoir through said valve into said intake conduit, and said valve closes when the pressure in said intake conduit is above the reference pressure, wherein said supplemental pressurization means further includes a second valve means for ingesting air into said intake conduit, and load connectors in communication with said conduits for receiving hydraulic loading devices, wherein said supplemental pressurization means becomes functional when the pressure in said intake conduit is below a reference pressure and ceases to function when the pressure inside said intake conduit is above a reference pressure.

4,371,319
HERMETIC MOTOR COMPRESSOR

Akira Murayama; Fumio Harada; Tetsuya Arata; Masato Itagaki, all of Shimizu; Susumu Nakayama, Shizuoka, and Masahisa Sofue, Minorimachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1980, Ser. No. 167,031
Claims priority, application Japan, Jul. 13, 1979, 54/88123
Int. Cl.³ F04B 21/00
U.S. Cl. 417—312 14 Claims

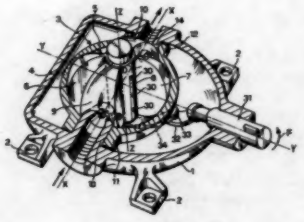


1. A hermetic motor compressor comprising: a closed housing provided at its upper portion with refrigerant gas return tubes through which a refrigerant gas is introduced thereinto to form an atmosphere of said refrigerant gas therein; a motor compressor having a motor at its upper area and a compressor at its lower area, said motor and compressor being connected to each other, said motor compressor being mounted in said closed housing by means of resilient support means; and heat insulating members covering an outer surface of a discharge chamber enclosing head cover, a discharge silencer and discharge tubes that are connected to said discharge silencer, spaces being provided between said heat insulating members and said head cover, discharge silencer and discharge tubes.

4,371,320
SEMI-ROTARY HYDRAULIC PUMP

Giulio Sacchi, Viale Bruno Buozzi 109, Roma, Italy

Filed Jul. 21, 1980, Ser. No. 170,900
Claims priority, application Italy, Jul. 23, 1979, 24557 A/79
Int. Cl.³ F04B 19/00, 29/00
U.S. Cl. 417—461 5 Claims



1. A semi-rotary hydraulic pump for pumping a liquid, said pump comprising:

a spherical pump body having a hollow interior, a liquid inlet, and a liquid outlet;

two spherical segment abutment stop portions fixed in diametrically opposite positions within the interior of said spherical pump body and which divide the interior of said pump body into first and second pumping chambers;

a sector mounted within said interior of said pump body, said sector having a sector shaft and two integrally formed spherical segment portions extending symmetrically with respect to said sector shaft, one of said spherical segment portions extending into each of said pumping chambers and dividing each pumping chamber into an inlet portion adjacent to said liquid inlet, and an outlet portion adjacent to said liquid outlet;

means for fluid communication between said inlet portion of each pumping chamber and said outlet portion of the other pumping chamber;

a first axis of oscillation coaxial with the axis of said sector shaft;

means for mounting said sector to allow said sector to oscillate about said first axis of oscillation;

a first pressure section formed by said inlet portion of said first pumping chamber and said outlet portion of said second pumping chamber;

a second pressure section formed by said inlet portion of said second pumping chamber and said outlet portion of said first pumping chamber;

said oscillation of said sector about said first axis of oscillation alternately causing an increase in volume in one of said first and second pressure sections, thereby creating a low pressure section, and causing a corresponding decrease in volume in the other of said first and second pressure sections, thereby creating a high pressure section;

a fixed support for supporting said pump body;

a conical seat formed in each of said spherical segment abutment stop portions;

two tubular bosses having a frusto-conical end portion formed on opposite sides of said spherical pump body;

a second axis of oscillation coaxial with the common axis of said tubular bosses and perpendicular to said first axis of oscillation;

two swivel bearings formed by said tubular bosses and said conical seats, said bearings allowing said pump body to oscillate about said second axis of oscillation;

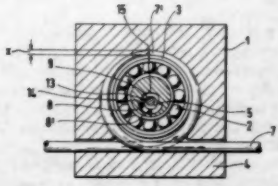
valve means having a plurality of liquid flow passages formed in said swivel bearings, said oscillation about said second axis of oscillation placing said liquid flow passages in alignment allowing fluid communication between said liquid inlet and said low pressure section and between said liquid outlet and said high pressure section through the passages thus formed; and

drive means for causing the oscillations about said first and second axes of oscillation, said oscillations synchronized with regard to each other so that said liquid is drawn from said inlet through said valve means into said low pressure section and is expelled from said high pressure section through said valve means and said pump outlet.

4,371,321
METERING PUMP

Jochen Koblo, and Stephan Schuck, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,562
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914745
Int. Cl.³ F04C 5/00; F04B 45/08
U.S. Cl. 418—45 7 Claims



1. A metering pump for a liquid or gaseous medium, comprising:

a generally cylindrical pump housing;

a deformable tube for the medium to be conveyed, said tube

being looped 360° around the inside surface of said housing;

a shaft rotatably supported along the central axis of said housing;

a first rotating member eccentrically mounted on said shaft to constitute a first eccentric, said first eccentric having a maximum radius which is suffficient to compress said tube into a closed position against the inside surface of said housing; and

means including a second eccentric on said shaft, the diameter of said second eccentric being smaller than the diameter of said first eccentric, for mounting said first eccentric on said shaft so that compression is automatically released against said tube at the point of maximum radius of said first eccentric in response to stopping of said shaft, wherein said first eccentric includes a chamber therein and said second eccentric is located within said chamber.

4,371,322

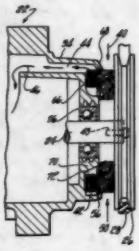
COMBINATION AIR PUMP AND AIR FILTER

Jack R. Lorraine, Yorktown, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 29, 1980, Ser. No. 191,731

Int. Cl.³ F04C *15/02*; B01D *46/10*

U.S. Cl. 418—47 **7 Claims**



1. A combination of a filter and an air pump, the air pump having an end bell adapted to receive air into the pump in an area around the axis of the pump and direct flow of the ingested air to a point about the periphery of the pump rotor in said pump, the combination comprising:

a coarse, cylindrical filter element for receiving air and adapted to prevent the passage of large particles therethrough;

a fine, resilient, cylindrical filter element concentric with said coarse filter element for receiving air therefrom and delivering air to the pump rotor along a portion of its outer peripheral surface;

a thin, rigid plate member interposed said coarse and fine filter elements and having an aperture therein for directing the air flow from said coarse filter element to said fine filter element;

bonding means for securing said coarse and fine filter elements to opposite sides of said plate member; and

retaining means on the end bell of the pump for snappingly engaging said plate member and cooperating with the compression of said fine filter element to retain said plate member in the end bell with said coarse filter member extending therefrom.

7. A combination of a filter in an air pump for a motor vehicle having a rotor shaft extending outward from the end bell of the pump and a pulley attached to the outward end of the rotor shaft and adapted to be driven by a belt means from a rotating shaft of the motor vehicle, the combination comprising:

a non-rotating filter supported by retaining means in the end bell and partially extending outwardly of the end bell and substantially filling the space interposed the end bell and the pulley, said non-rotating filter having:

a cylindrical, coarse filter element having at least one flat end surface and an axially located cylindrically-shaped aperture therein;

a cylindrical, fine filter element having at least one flat end surface and an axially located cylindrically-shaped aperture therein, said aperture being larger than said aperture of said coarse filter element; and

a thin, rigid baffle member bonded along each broadside to said at least one flat end surfaces of each of said coarse and fine filter elements and having an axially located aperture therein smaller than said aperture of said fine filter element and said member snappably engaged with the retaining means in the end bell for compressively holding said fine filter member in the end bell.

4,371,323

SPIRAL ROTATION DISPLACEMENT MACHINE WITH PARALLEL MOTION DEVICES ENSURING RELATIVE TORSIONAL RIGIDITY

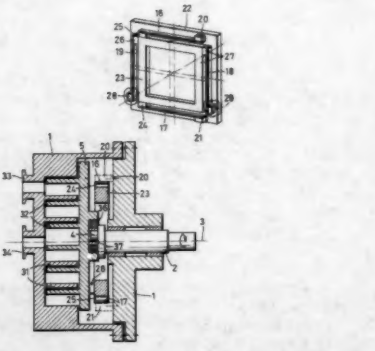
Berthold Fischer, Erftstadt-Lechenich; Hans-Peter Kabelitz, Cologne, and Andreas Schmitz, Weilerswist, all of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,106

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1979, 2927690

Int. Cl.³ F01C *1/02, 21/00*; F16D *3/04*

U.S. Cl. 418—55 **12 Claims**

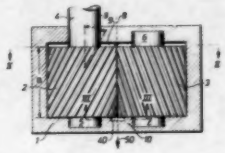


1. A rotary spiral-type fluid displacement machine comprising: two displacement elements mounted for displacement relative to one another so as to execute a translation rotary movement; and means ensuring the relative torsional rigidity of the elements while executing such translation movement, said means comprising two guides disposed substantially perpendicular to one another; wherein at least one guide comprises a parallel motion device comprising a pair of leaf springs.

4,371,324
HELICAL GEAR MACHINE WITH IMPROVED HIGH PRESSURE PORT

Berth U. Gustafsson, Österskär, Sweden, assignor to AB Bonierforetagen, Sweden

PCT No. PCT/SE79/00182, § 371 Date May 6, 1980, § 102(e) Date May 2, 1980, PCT Pub. No. WO80/00592, PCT Pub. Date Apr. 3, 1980
PCT Filed Sep. 6, 1979, Ser. No. 195,016
Claims priority, application Sweden, Sep. 6, 1978, 7809394
Int. Cl.³ F01C 1/16, 21/12; F04C 2/16, 18/16
U.S. Cl. 418—201 6 Claims



1. An axial flow gear machine comprising two helical gears running in mesh with each other, a first sealing body arranged against one end surface of the gear pair, a fluid port in the first sealing body, a second sealing body arranged against outside circles of the gears at least at one gear meshing zone, tooth profiles of the two gears being alike with each tooth profile including a tooth flank which continuously merges into a rounded top and a rounded bottom, each tooth extending less than one revolution around the respective gear, the tooth tops of one of the gears being adapted for sealing against the tooth bottoms of the other of said gears in a plane through the axes of the gears, the coacting teeth of the gears mutually sealing along the whole of the pitch point line, an orifice of the port facing the gears substantially comprises a zone defined by the union of surfaces each defined by the outside circle and a root circle of the respective gear teeth between the axes plane and a gear radius forming an angle (α) with the axes plane, said angle (α) at most attaining $B \times (1/R) \times$ tangent β, where B is the width of the gear pair, R is the outside circle radius of the respective gear, and β is the helix angle of the gears, the angle (α) between the axes plane and the gear radius being less than 2π, and the helix angle being between 20° and 45°.

4,371,325
APPARATUS FOR FORMING STRUCTURES IN THE FORM OF SEGMENTS OF A SPHERE

Charles H. Harbison, 3217 Georgetown Pl., Birmingham, Ala. 35216

Filed Apr. 8, 1980, Ser. No. 138,298
Int. Cl.³ E04B 2/84
U.S. Cl. 425—63 7 Claims

1. Apparatus for forming a structure having an inner surface which defines at least one segment of a sphere comprising:

(a) an inner support member embodying an upstanding shaft-like member adapted to be anchored to a fixed point from which a radius can be struck to define the inner surface of the segment to be formed,

(b) a collar-like member mounted for rotation on said shaft-like member,

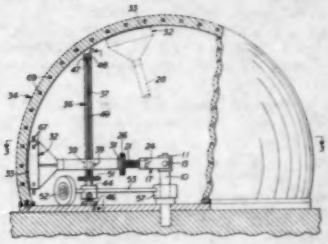
(c) a U-shaped clevis-like member having its legs pivotally connected to said collar-like member,

(d) an elongated tubular member having external threads in threaded engagement with a threaded opening through the base of said U-shaped clevis-like member,

(e) an elongated shaft-like element extending through said tubular member,

(f) an elongated radial member secured at one end to one end of said shaft-like element with the other end of said radial member extending outwardly from said shaft-like element and with said radial member adapted for horizontal pivotal movement and vertical pivotal movement relative to said inner support member,

(g) a stop member carried by the other end of said shaft-like element in position to engage the adjacent end of said



tubular member and limit axial movement of said shaft-like element relative to said tubular member,

(h) means for rotating said tubular member relative to said clevis-like member to vary the effective length of said radial member,

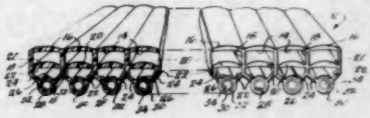
(i) a forming member carried by said other end of said radial member with the other surface of said forming member being in the shape of the inner surface of said segment of a sphere to be formed, and

(j) actuator means operatively connected to said radial member and adapted to pivot said radial member horizontally and vertically to selected angular locations to position the outer surface of said forming member carried by said radial member opposite and adjacent the location of the inner surface of said segment of a sphere to be formed so that said segment is formable directly on the outer surface of said forming member.

4,371,326
APPARATUS FOR MAKING PLASTIC SOLAR PANEL STRUCTURE

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

Division of Ser. No. 6,754, Jan. 26, 1979, Pat. No. 4,271,103.
This application Dec. 4, 1980, Ser. No. 213,200
Int. Cl.³ B29C 17/07
U.S. Cl. 425—71 18 Claims



1. Apparatus for making a panel structure of plastic material having a uniform cross-sectional configuration throughout its longitudinal extent and a multiplicity of parallel passages extending longitudinally therethrough defined by a multiplicity of longitudinally extending integrally interconnected exterior and interior thin wall sections, each of said interior thin wall

sections defining parts of two adjacent passages, each of said passages being defined at least in part by an interior thin wall section, said apparatus comprising

a die having an extrusion outlet defined by a multiplicity of interconnected slots corresponding generally in number and position to said multiplicity of thin wall sections and fluid outlets between interconnected slots of the extrusion outlet corresponding generally in number and position to said passages,

means for continuously feeding plastic material to the extrusion outlet of said die at an elevated temperature sufficient to render the plastic material flowable and at a pressure sufficient to cause the heated plastic material to continuously move longitudinally outwardly of said extrusion outlet so that the interconnecting slots thereof form the heated plastic material into said multiplicity of interconnected thin wall sections,

means for reducing the temperature of the plastic material moving longitudinally away from said extrusion outlet through the slots defining the exterior thin wall sections by exterior heat exchange while controlling the exterior configuration thereof for a time period sufficient to enable the moving exterior thin wall sections to be self-sustaining, and

means for feeding fluid to said fluid outlets so as to cause fluid to flow longitudinally outwardly of said fluid outlets into each passage defined by the thin wall sections moving longitudinally away from said extrusion outlet while controlling the relative fluid pressure acting within adjacent passages on opposite sides of said interior thin wall sections so as to control the position thereof relative to said exterior thin wall sections until the temperature thereof is reduced by heat exchange with said fluid sufficiently to enable said moving interior thin wall sections to be self-sustaining,

said die further including separate annular slot-shaped outlets disposed in surrounding relation to certain of said fluid outlets and surrounded relation with the interconnected slots associated therewith and means for continuously feeding a second plastic material to the annular slot-shaped outlets of said die at an elevated temperature sufficient to render the second plastic material flowable and at a pressure sufficient to cause the heated second plastic material associated with each annular slot-shaped outlet to continuously move longitudinally outwardly thereof in a sleeve formation which is expanded outwardly into engagement with the thin wall sections defining the passage within which the sleeve is moving by the associated fluid flowing therein.

4,371,327

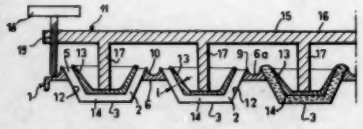
APPARATUS FOR USE IN PRODUCING CUP-SHAPED PASTRIES

Andre Fievez, 32, rue de Valenciennes, 59198 Haspres, France

Filed May 20, 1980, Ser. No. 151,732

Int. Cl.³ B29C *1/00, 17/10;* **A21B** *11/10*

U.S. Cl. 425—218 **7 Claims**



1. Apparatus for producing pastry comprising a plate having a plurality of mold cavities disposed at spaced intervals in a uniform repeating and modular pattern, means for cutting a main sheet of dough laid over said plate into individual dough pieces each registering with a mold cavity, means for implementing removal from said plate of portions of said dough sheet between said cavities and means for pressing said individual dough pieces into respective cavities of said sheet, comprising a rigid support and a plurality of cup-shaped pressing elements secured on the lower side of said support, said cup-shaped pressing elements being of a shape corresponding to the shape of said mold cavities but of smaller size to be received in said mold cavities, and being disposed on said support at spaced intervals in the same uniform repeating, modular pattern as said mold cavities so that each cup-shaped element registers and cooperates with a corresponding mold cavity of said plate, said cup-shaped elements cooperating with said mold cavities to press said individual dough pieces into said mold cavities and confine them between said mold cavities and said cup-shaped elements.

4,371,328

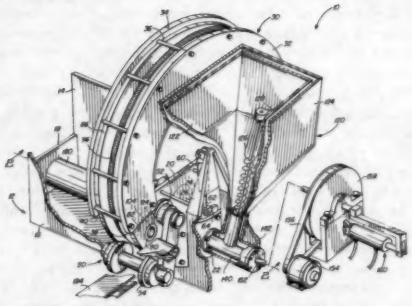
APPARATUS FOR MAKING COMPOSITION LOGS BY COMPRESSING PARTICLES

Duane D. Giles, 3605 N. Paradise Rd., Flagstaff, Ariz. 86001, and Richard W. Osborn, 4667 Ridgeway, Los Alamos, N. Mex. 87544

Continuation-in-part of Ser. No. 137,790, Apr. 7, 1980, abandoned. This application Apr. 14, 1981, Ser. No. 254,063

Int. Cl.³ A01J *25/12*

U.S. Cl. 425—344 **34 Claims**



1. Particulate compacting apparatus, in combination, comprising:

a base having a filling station, a compression station and a discharge station;

a frame having an axis of rotation and mounted rotatably on the base;

a plurality of compression chambers mounted on the frame;

a filling subassembly mounted at the filling station for successively filling the compression chambers with particulate material and for precompressing the particulate material;

a compression subassembly mounted at the compression station for further compressing the particulate material;

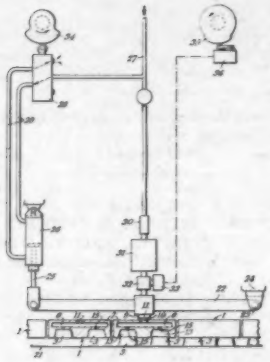
indexing drive means mounted on the base for advancing the frame stepwise to advance the compression chambers from station to station; and

a discharge subassembly mounted at the discharge station cooperative with the compression chambers for successively discharging the logs therefrom.

4,371,329
APPARATUS FOR MAKING CONFECTIONERY

Gordon Steels, Peterborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Jun. 3, 1981, Ser. No. 269,856
Claims priority, application United Kingdom, Jun. 18, 1980, 8019864
Int. Cl.³ B29C 7/00, 3/02
U.S. Cl. 425—437 5 Claims



1. Apparatus for moulding confectionery, comprising a conveyor, a train of moulds attached to said conveyor, each of said moulds comprising a body formed with at least one mould cavity having in its base a plurality of minute holes, a backing plate, formed with a hole, being attached to the body and being spaced from the base of each mould cavity to define an air chamber, and a demoulding unit, said conveyor being operative to bring said moulds in succession to a position in which said mould is disposed beneath said demoulding unit in inverted relation and with each mould cavity therein facing downwardly, said demoulding unit including an air pipe, means for moving said air pipe downwardly into sealing engagement with said hole in the backing plate of the mould positioned beneath the demoulding unit and means for discharging compressed air from said pipe into the air chamber of said mould and thence through the minute holes in the base of each mould cavity to effect discharge of the confectionery in each mould cavity in the mould.

4,371,330
ADJUSTABLE SCREED BAR APPARATUS

Peter C. Heffernan, Piedmont, S.C., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Sep. 22, 1980, Ser. No. 189,262
Int. Cl.³ B28B 1/29; E01C 19/22
U.S. Cl. 425—458 2 Claims

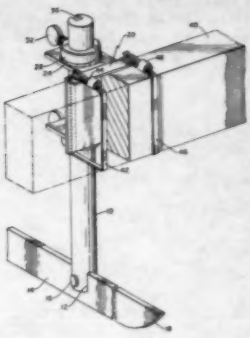
1. An adjustable screed bar assembly for leveling wet fluid layers of lightweight thermal-insulating concrete cast over substrates, said assembly comprising;

(a) a horizontally arranged screed bar of rectangular configuration for leveling said concrete; and

(b) an adjustable support assembly for said screed bar positioned near each end of said screed bar, said support assembly comprising;

(i) a vertical shaft having a sled runner attached at its lowermost end, said runner having a curved leading end to permit the runner to easily move through said concrete and over irregularities in said substrate; said shaft further having a vertical channel therein; and

(ii) screed bar bracket means adjustably mounted upon said shaft upwardly of said runner comprising an L-shaped metal bracket receiving said screed bar, a pair of angle irons one end of each of which is secured to said metal bracket, the remaining end of each of which angle irons having an opening through which said shaft slides and a collar adjacent said opening and secured to said angle iron end; said collar having a locking thumbscrew

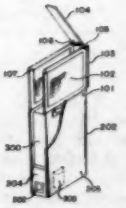


which when operated secures said screed bar bracket means into said vertical channel in said shaft to thereby prevent said bracket means from moving vertically with respect to said shaft and also rotationally about said shaft.

4,371,331
CIGARETTE LIGHTER WITH FLIP-OUT WINDSHIELD

Kuo-Cheng Lee, No. 18-2, Yu-Lo La., Pei-Tah Rd., Wen-Hua Li, Hsin Chu, Taiwan

Filed Aug. 14, 1980, Ser. No. 177,841
Claims priority, application Taiwan, Mar. 12, 1980, 6921134
Int. Cl.³ F23Q 25/00
U.S. Cl. 431—151 5 Claims



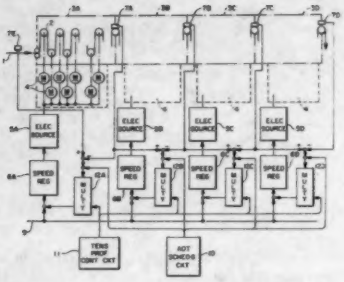
1. A cigarette lighter with flip-out windshield comprising a conventional lighting device including a fuel tank, lighting mechanism and a flaming tip, a casing in which said conventional lighting device is accommodated, characterized in having a windshield formed of two symetrically opposing side panels, a rear panel fixedly connecting said side panels, a top lid with its rear edge hinged to each of two upper rear corners of said opposing two side panels, said opposing two side panels being hinged at the lower, rear corners to said casing with a hinge pin and being capable of rotating around said hinge pin to move in and out of clearance provided between said conventional lighting device and said casing.

4,371,332

METHOD OF CONTROLLING THE TENSION OF A STRIP WITHIN FURNACE

Motoyuki Matsuo, Akashi; Haruo Komoto, and Yoshihisa Mita, both of Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1981, Ser. No. 274,052
Claims priority, application Japan, Jun. 19, 1980, 55-84824
Int. Cl.³ F27B 9/28; F26B 13/00; C21D 9/52
U.S. Cl. 432—1 1 Claim



1. A method of controlling the tension of a strip within a furnace forming a process line which is divided into a plurality of sections, the method comprising the steps of comparing a predetermined tension which has been allotted to each of said sections with an actual tension which has been sensed in a corresponding one of said sections so as to form a tension deviation for each of said sections, comparing a predetermined reference tension profile which has been developed for the entire furnace with an actual tension profile which has been sensed by tension sensors in said furnace so as to determine a correction factor corresponding to the difference between said reference tension profile and said actual sensed tension profile, correcting said tension deviation in accordance with said correction factor, and controlling both said tension allotted to each of said sections and said tension profile developed for said process line with said corrected tension deviation and, upon varying the so determined tension profile, successively and sequentially changing said tension allotted to said respective sections, starting with a predetermined section of the furnace.

4,371,333

DEVICE AND PROCESS FOR OPERATING AN OPEN BAKING FURNACE FOR MANUFACTURING CARBON-BEARING, SHAPED BODIES

Robert Moser, Steg, Switzerland, and Gottfried Jungblut, Wehr, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

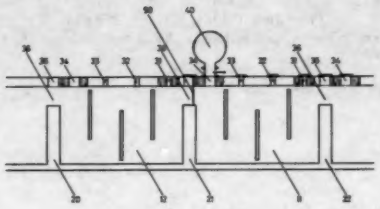
Filed Aug. 7, 1981, Ser. No. 290,755
Claims priority, application Switzerland, Aug. 15, 1980, 6165/80
Int. Cl.³ F27D 1/16; F27B 7/00
U.S. Cl. 432—3 10 Claims

8. A process for operating an open baking furnace comprising the steps of:

providing a flue with a plurality of headwalls wherein one of said headwalls divides said flue into a first chamber and a second chamber;

providing said first chamber with a plurality of openings positioned along the longitudinal axis of said first chamber;

locating an exhaust gas manifold at the first of said plurality of openings closest to the one of said headwalls of said



chamber such that said exhaust gas manifold is offset from all of said plurality of headwalls; and

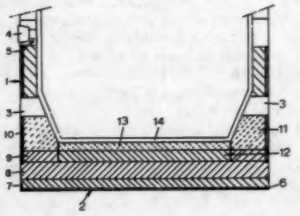
closing off the remaining openings.

4,371,334

SHAFT FURNACE, PARTICULARLY THE REFRACTORY CONSTRUCTION OF THE BOTTOM THEREOF

Jacobus Van Laar, Santpoort, Netherlands, assignor to Estel Hoogovens BV, IJmuiden, Netherlands

Filed Mar. 19, 1981, Ser. No. 245,375
Claims priority, application Netherlands, Mar. 21, 1980, 8001669
Int. Cl.³ F27D 1/08; C21B 7/08; F27D 1/14
U.S. Cl. 432—95 9 Claims



1. In a shaft furnace having a bottom and a furnace wall extending upwardly from the bottom, the bottom having a plurality of layers of refractory materials, which layers comprise a graphite layer, above the graphite layer an intermediate layer of material having a λ-value (coefficient of thermal conductivity) lower than that of the material of the graphite layer, and above the intermediate layer a third layer of material having a λ-value which is of not more than 4 kcal/m.h.° C. and is lower than that of the material of the intermediate layer, the improvement that:

the λ-value of the material of said intermediate layer is in the range 12 to 30 kcal/m.h.° C.

4,371,335

ZONE SEPARATOR FOR MULTIPLE ZONE VESSELS

John B. Jones, Grand Junction, Colo., assignor to Paraho Corporation, Grand Junction, Colo.

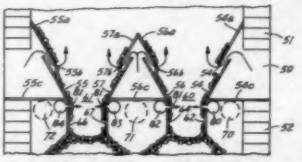
Filed Apr. 17, 1981, Ser. No. 255,163
Int. Cl.³ F27D 1/08; E27B 17/12; B01J 1/00; F24F 9/00
U.S. Cl. 432—95 13 Claims

1. Apparatus for treating non-uniformly sized and shaped particulate solid material, comprising:

(a) a substantially vertically extending hollow vessel having upper and lower zones, wherein the particulate material is fed into the upper zone of the vessel and treated particulate material is withdrawn from the lower zone of the vessel, said zones having dissimilar gaseous atmospheres passing therethrough, and wherein the particulate mate-

rial descends under the force of gravity through the upper zone and then the lower zone; and

(b) zone separator means situated within said vessel between said upper and lower zones for passing said particulate material from the upper zone to the lower zone on a uniform basis across the lateral extent of said vessel while simultaneously preventing the passage of said gaseous atmospheres through said zone separator means from one zone to the other, said zone separator means having a plurality of down-comer throats for permitting uniform downward flow of said material therethrough and a plurality of barrier means adjacent to said down-comer throats for preventing passage of said material and said gaseous atmospheres therethrough and for directing said material toward said down-comer throats, each of said barrier means including at least one sloped wall extending upwardly and away from the top of one of said down-comer throats at an angle above the horizontal plane greater than the repose angle of said particulate solid material in said vessel, each of said down-comer throats having a minimum lateral dimension of from about 4 to



about 6 times the maximum dimension of the largest particle of said solid material to be treated, the combined minimum lateral cross-sectional area of said plurality of down-comer throats lying within the range of from about 30 percent to about 40 percent of the lateral cross-sectional area of said vessel at the location of said zone separator means, said down-comer throats having downwardly extending side walls for directing said solid particulate material, each of said side walls having a vertical length equal to at least the minimum lateral cross-sectional dimension of said down-comer throat, said side walls forming gas collecting spaces therebetween for collecting gases which disengage from the upper surface of the bed of particulate solid material in said lower zone, said zone separator means further including seal gas injection means in fluid communication with said down-comer throats for injecting a sealing curtain of gas therein for maintaining the separation of the gaseous atmospheres in said upper and lower zones of the vessel while simultaneously permitting uniform downward flow of said particulate material through said down-comer throats.

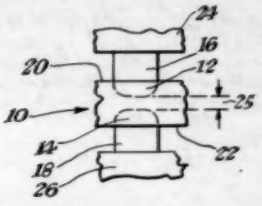
4,371,336
ORTHODONTIC POSITIONER
Terry B. Hilleman, 621 SW. 74th Ter., Plantation, Fla. 33317
Filed Jan. 29, 1981, Ser. No. 229,560
Int. Cl.³ A61C 7/00
U.S. Cl. 433—6 **3 Claims**

1. An improved tooth positioner utilizing tooth contacting edges for actively moving individual teeth to or toward an ideal centric occulsion position by simultaneously engaging, moving, and positioning said individual teeth of upper and lower teeth by force being exerted on contacting edges and a minimal area of adjacent sides of buccal and lingual surfaces of each individual tooth by the act of biting into said tooth positioner, comprising:

a one piece preform tooth impression means for providing resilient lateral force to individually move and position individual teeth of said upper and lower teeth by simultaneously engaging only the contacting edges of said upper and lower teeth and a minimal adjacent area of said buccal and lingual surface of each tooth of said upper and lower teeth, said one piece preform tooth impression means for forcing said contacting edge of each tooth to move each said tooth into the most ideal centric occulsion and cusp-fossa relationship by the act of biting into said one piece preform tooth impression means with said upper and lower teeth and for retaining said contacting edge and a minimal adjacent area of said buccal and lingual surfaces of each individual said tooth in the most ideal centric occulsion and cusp-fossa relationship by the act of biting into said one piece preform tooth impression means with said upper and lower teeth,

said one piece preform tooth impression means for providing a comfortable, light prostetic device that enhances a user's cooperation for continued use,

said one piece preform tooth impression means having separated resilient tooth impressions for individual teeth of said upper and lower teeth situated in certain select positions generally at the ideal centric occulsion and cusp-fossa relationship,

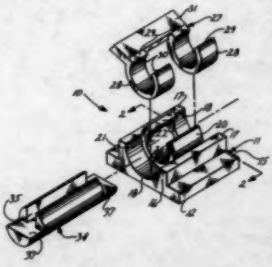


said one piece preform tooth impression means having a top with individual upper contacting edge tooth impressions and a bottom with individual lower contacting edge tooth impressions,

said upper contacting edge tooth impressions and lower contacting edge tooth impressions covering a minimal adjacent area of the buccal and lingual surface of approximately two to three millimeters of each tooth of said upper teeth and said lower teeth,

said upper contacting edge tooth impression and said lower contacting edge tooth impression terminating well short of contact with gum tissue of said upper and said lower teeth.

4,371,337
ORTHODONTIC BRACKET
Erwin C. Pletcher, P.O. Box 566, Rancho Santa Fe, Calif. 92067
Filed May 20, 1981, Ser. No. 265,377
Int. Cl.³ A61C 7/00
U.S. Cl. 433—10 **14 Claims**



1. An orthodontic bracket assembly, comprising:

a base with a labially extending support member having a mesiodistally extending opening therethrough, the open-

ing extending through a first slot in the support member to provide clearance for insertion of an arch wire;

a locking member having a hub with a mesiodistal passage therethrough, the passage extending through a second slot to provide clearance for insertion of the arch wire; and

an arch-wire bar configured to fit in the support-member opening and locking-member passage, the bar having a mesiodistal third slot to receive the arch wire, the locking member being rotatable on and captively retained by the bar, the first and third slots being generally aligned;

the locking member being rotatable between open and closed positions, the open position aligning the slots to enable seating of an arch wire in the bar slot, and the closed position placing the second slot out of alignment with the first and third slots to capture the arch wire within the bracket assembly.

4,371,338

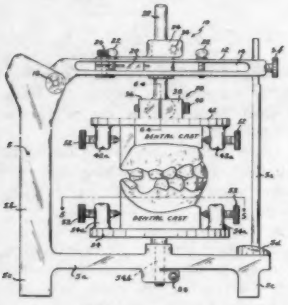
DENTAL ARTICULATOR HAVING SIMPLIFIED MEANS FOR MOUNTING DENTAL CASTS

Roger W. Mercer, 1340 Arlington Dr., Fairborn, Ohio 45324, and Louis E. Hay, 847 Woodhill Rd., Dayton, Ohio 45431

Filed Jul. 11, 1979, Ser. No. 56,536

Int. Cl.³ A61C *11/00*

U.S. Cl. 433—60 **2 Claims**



1. A dental articulator for mounting and adjusting matched upper and lower dental casts having at least one unthreaded aperture in the base of said dental casts, said articulator comprising:

(a) an articulator body having a base element and at least one vertical element extending upward from said base element;

(b) a lower dental cast mounting jig supported by the base element of said articulator body, said mounting jig having at least one upward protruding locating pin for engaging an aperture in the base of said lower dental cast and locating said lower dental cast in mounted position on said mounting jig, and further having fastening means for releasably retaining said lower dental cast in mounted position on said mounting jig; and,

(c) an upper dental cast mounting jig for mounting and adjusting said upper dental cast in centric anatomical relationship with said lower dental cast, said upper mounting jig having a normally horizontal frame member with spaced apart elongated side elements and being pivotally joined to the vertical element of said articulator body to be superimposed with the base element of said articulator body, an elongated transverse bar member spanning the side elements of said frame member and being retainably movable fore and aft with the side elements of said frame member for providing anterior-posterior movement of said upper dental cast in relationship with said lower dental cast, a lateral movement block member longitudinally and retainably slidable on said transverse bar member for providing lateral movement of said upper dental cast in relationship with said lower dental cast and having a vertical bore therethrough, a vertical movement member retainably movable in the vertical bore of said lateral movement block member for providing vertical movement of said upper dental cast in relationship with said lower dental cast, a dependent wobble plate assembly operably attached to said vertical movement member for providing retainable rotational and canting movement of said upper dental cast in relationship with said lower dental cast, said wobble plate assembly having at least one downward protruding locating pin for engaging an aperture in the base of said upper dental cast and locating said upper dental cast in mounted position on said wobble plate assembly, and fastening means for releasably retaining said upper dental cast in mounted position on said wobble plate assembly.

4,371,339

DENTURE MOLD, AND METHOD OF AND ARRANGEMENT FOR ITS MANUFACTURE

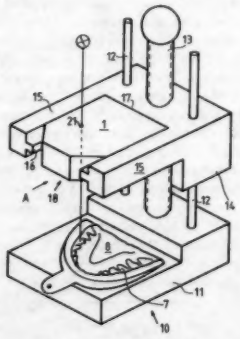
Manfred P. Zeiser, Im Wolfsgalden 8, 7141 Schwieberdingen, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,549

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949697

Int. Cl.³ A61C *19/00*

U.S. Cl. 433—74 **41 Claims**

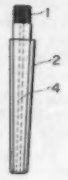


1. A denture mold for making teeth prostheses, such as fillings, crowns, bridges, denture parts and the like, comprising a base element for releasably supporting a positive copy of teeth and made of a mold material; and a plurality of pins arranged to connect the positive copy with said base element, said base element being formed as a prefabricated plate of a shape-retaining material and said pins being arranged on said plate parallel to one another and fixed on the same, so that said plate serves as a holder for said pins during making of the positive copy, whereupon said plate serves as a base of the denture mold, each of said pins being elongated and having at least two portions, as considered in direction of elongation, said portions having different cross-sections separated by a separation plane and a maximum cross-section in said plane, said portions of each of said pins being conical and having base faces superimposed over one another.

4,371,340
DOWELL PIN AND METHOD OF MAKING DENTAL MODELS

Hiroo Imaizumi, Tokyo, Japan, assignor to Colpo Company, Ltd., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,270
Claims priority, application Japan, Jun. 14, 1980, 55-83422[U]
Int. Cl.³ A61C 19/00
U.S. Cl. 433—74 10 Claims

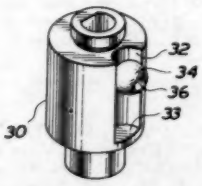


1. A dental dowel pin, said dowel pin being formed entirely of a relatively hard plastic material, said dowel pin being formed with a smooth mirror-like finish over substantially all of its external surface, said finish having relatively low friction and relatively low abrasion characteristics and said dowel pin being formed with a through passage running centrally through its entire length, whereby said dowel pin can be implanted in an already hardened dental model using adhesive in a prepared oversized opening in said model with the trapped air and excess adhesive caused by implantation of the pin escaping via said through passage to thus prevent adhesive from overflowing onto the outside of said pin and onto said mold.

4,371,341
DENTAL HANDPIECE

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg. Co. Ltd., Kanuma, Japan

Filed Apr. 13, 1981, Ser. No. 253,359
Int. Cl.³ A61C 1/07
U.S. Cl. 433—118 3 Claims

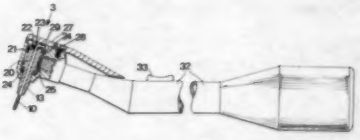


1. A dental handpiece for the treatment of root canals comprising: a handle portion; a powerhead assembly integrally and perpendicularly linked to said handle portion; a bushing integrally inserted into said handle portion; a rotating driving shaft journaled for rotation by means of a sleeve in said bushing, said rotating driving shaft having an integral circular disc at its top end portion, said circular disc carrying around its periphery a pinion lug which is parallel to both said disc and said rotating driving shaft; a hollow cylinder kept in motion inside said powerhead assembly at its top end held by a bushing and at its lower end by a bushing cap respectively, said hollow cylinder being perpendicular to the axis of said rotating driving shaft and also having an arc-shaped longitudinal slot; a ball bearing slidably inserted into said slot having a spherical surface to coincide with the arc-shaped slot and slidably inserted into said longitudinal slot, said ball bearing having a central horizontal opening; said pinion lug of said circular disc being slidably inserted into the central horizontal opening of said ball bearing so as to couple said rotating driving shaft with said hollow cylinder; said handle portion being provided with a pair of slits at its top portion and parallelly to said rotating driving shaft; said top portion being also formed with a pair of bores vertically to cross said slits respectively, one of said bores being provided to abut upon a longitudinal hollow of said hollow cylinder; another bore being provided with a spiral groove; a locking plate having a pair of openings to coincide with said bores and slidably inserted into said slits; a screw threadedly set into said grooved bore and said neighboring slit to fix said locking plate; and a drilling tool firmly held into said longitudinal hollow of said cylinder and fastened by a screw set into a top portion of said drilling tool through said ungrooved bore and said neighboring opening so as to keep said drilling tool at right angle to the axis of said rotating driving shaft whereby said drilling tool is driven to rotate in one direction and in the opposite direction alternately through a continuous circular rotation of said driving shaft.

4,371,342
DENTAL ANCHORING MEANS

Stuart J. Filhol, Castlefrek, County Cork, Ireland

Filed Apr. 29, 1981, Ser. No. 258,651
Claims priority, application United Kingdom, Apr. 29, 1980, 8014134
Int. Cl.³ A61C 5/04
U.S. Cl. 433—225 7 Claims



1. In combination dental anchoring means and a dental handpiece for receiving the anchoring means; the anchoring means comprising a shank section and a threaded dental pin section detachably secured to one end of the shank section, said pin section adapted for detachment from the shank section when the pin section is screwed into a tooth, the shank section having at its end remote from the pin section a turned-over securing portion; the dental handpiece means for holding the anchoring means, said holding means comprising a rotatable member having a longitudinal axial bore for receiving the shank section, said dental pin section projecting through an end of said bore, said dental handpiece comprising powered means for rotatably driving the rotatable member,

wherein the improvement comprises defining the rotatable member as a sleeve in which the bore is open-ended, the pin section projecting through one, lower end of the bore and at the other, upper end of the bore the rotatable member having a stop member, the dental anchoring means being locatable through the bore with said turned-over portion engaging the stop member so that the anchoring means rotates with the rotatable member;

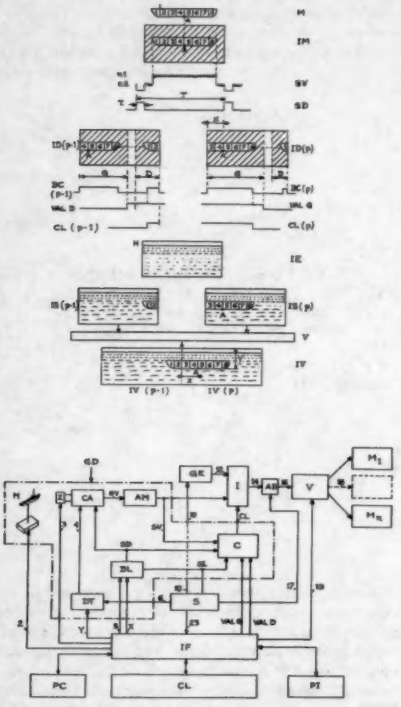
said improvement further comprising forming the rotatable member united as part of the dental handpiece so that the rotatable member is in direct driving engagement with said driving means, and the dental handpiece further comprising a securing member movable to be locatable over the upper end of said bore to retain the anchoring means in the rotatable member against upward movement along the bore.

4,371,343

PROCESS AND SYSTEMS FOR THE ELECTRONIC GENERATION OF WIDE-ANGLE MOVING IMAGES FOR TRAINING IN THE NAVIGATION OF SHIPS

Philippe Y. J. Paris, Fontenay le Fleury, and Alain Couturier, La Celle St. Cloud, both of France, assignors to Le Materiel Telephonique Thomson-CSF, Columbes, France

Filed Feb. 28, 1980, Ser. No. 125,656
Claims priority, application France, Mar. 2, 1979, 79 05497
Int. Cl.³ G09B *9/06*
U.S. Cl. 434—29 **8 Claims**



1. A process for electronically generating wide-angle moving images, especially for systems providing training in the navigation of ships, by means of which a wide-angle image constituted by the apparent juxtaposition of elementary images subtending respectively an angle α on as many television monitors, and by means of which an object represented on these images moves from one image to the next without discontinuity, comprising the steps of:

(a) defining the coordinates of the object, which form the wide-angle image and the displayed elementary images, by the coordinates of a reference point (A) determined by the intersection of the support rotational axis of a model of the object (M) and the base of this model;

(b) pointing the optical axis of a camera at the reference point;

(c) determining the dimensions and distance of the object as well as those of the model such that the camera angle of view always exceeds the apparent angle subtended by the model;

(d) feeding the camera with a synchronization signal, which is a line blanking signal (SD) delayed with respect to the line blanking reference signal fed to all the monitors, this delay being proportional to the position of the object in the moving image;

(e) obtaining an object video signal (SV) from the camera and applying it to a monitoring cathode-ray tube synchronized by the line blanking reference signal to produce a shifted object image (ID (p−1) and ID (p)) divided vertically by a black band corresponding to the delayed line blanking signal fed to the camera, into a right-hand part and a left-hand part on either side of this band;

(f) producing a given number of elementary images by feeding a memory, such as a magnetic-disc video recorder, the line blanking reference signal for the simultaneously triggered readings of as many synthetic images recorded in this memory;

(g) determining the order p of the elementary image in which the reference point is located at a given instant by taking the whole-number part of the quotient resulting from the division of the reference point azimuth θ in the wide-angle image by the angle α;

(h) determining the azimuth X of the reference point in the image of order number p, and taking the remainder resulting from the division of the azimuth θ by the angle α;

(i) producing the synthetic images one-by-one in a cyclic manner, as a function of the order number of the elementary image considered by electronic inlaying of the shifted ship image onto an environment image in the case of an elementary image of order number p, p−1, or p+1, and by simple recording of the environment image for the other order numbers;

(j) determining the delay R(p) of the delayed line blanking signal fed to the camera for an image of order number p such that the azimuth of the reference point in this image is effectively equal to the value X, the delays R(p−1) and R(p+1) of the delayed line blanking signal fed to the camera for an image of order number p−1 and for an image of order number p+1 being R(p)−τ amd R(p)+τ, the interval τ being the duraction of the delayed line blanking signal as well as that of the line blanking reference signal;

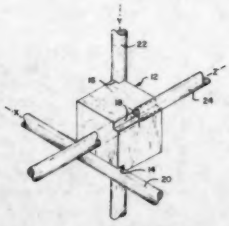
(k) validating the inlay when the azimuth X is less than $\alpha/2$ for the left-hand part of the shifted image of order number p, as well as for the right-hand part of the image of order number p−1, and when the azimuth is greater than $\alpha/2$ for the right-hand part of the image of order number p as well as for the left-hand part of the image of order number p+1.

4,371,344

TENSION MODEL DEVICE

Edward Gorczyca, 2905 Hemlock Dr., Allison Park, Pa. 15101

Filed May 4, 1981, Ser. No. 260,043
Int. Cl.³ G09B *23/08*
U.S. Cl. 434—302 **3 Claims**



1. A tension model device comprising:

(a) three struts each having a pair of opposite ends and crossing each other near a center portion of each strut;

(b) a plurality of tension strands in which strands are joined

from each end of all the struts to each end of the other struts; and

(c) a removable block means inserted where the struts cross each other, the block means having three non-intersecting notches on its surface engaging each strut and spacing the struts from each other where the struts cross each other, the notches are each formed by two substantially planar surfaces intersecting each other.

4,371,345

MULTI-DIMENSIONAL DISPLAY EQUIPMENT

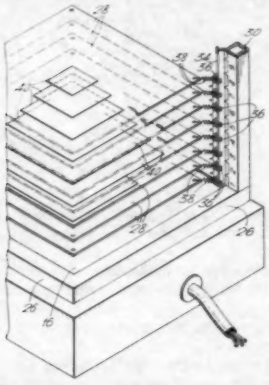
John H. W. Palmer, Henleaze, and Alexander J. R. MacDonald, Clifton, both of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB79/00033, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO80/01728, PCT Pub. Date Aug. 21, 1980

PCT Filed Feb. 19, 1979, Ser. No. 198,008

Int. Cl.³ G09B *23/30, 25/00*

U.S. Cl. 434—368 **23 Claims**



1. Multi-dimensional display equipment, comprising a plurality of transparent panels bearing representations of cross-sections of a three-dimensional body, and a support structure in which the panels are mounted in their correct relative order and spaced apart, and allowing the sectional representations to be viewed in situ from different positions externally of the structure by means of light transmitted through the transparent panels, the support structure being adapted to support the panels individually and peripherally so that they are individually removable from the support structure to vary the amount of the body represented or replaceable by panels representing a different body, the panels being rectangular and of flexible material and operatively mounted to the support structure, resilient means for applying tension to the corners of the panels whereby the panels are omni-directionally tensioned in a manner which is capable of maintaining the panels in an essentially flat planar configuration in a horizontal plane or in any other plane.

4,371,346

SYSTEM FOR PROPULSION OF BOATS BY MEANS OF WINDS AND STREAMS AND FOR RECOVERY OF ENERGY

Jean-Pierre Vidal, 2, place des Eglantines, 91540 Mennecy, France

Filed Aug. 20, 1980, Ser. No. 179,853

Claims priority, application France, Aug. 31, 1979, 79 21904

Int. Cl.³ B63H *13/00*

U.S. Cl. 440—8 **11 Claims**

1. An improved system for propulsion of a floating unit of the boat type, by means of winds and streams and for recovery of disposable energy from floating stations neither moored nor anchored said improved system comprising mounted on said floating unit:

a superstructure supporting device and, on said structure;

at least one aerial feathered propeller having a substantially horizontal shaft and provided at the upper end of a supporting pylon rotatable about its longitudinal axis;

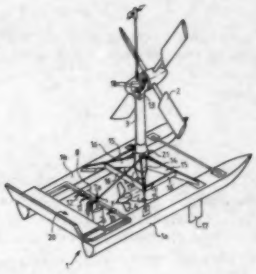
pitch variation and reversal means actuating on said aerial propeller;

means for controlling the rotation of said pylon and the azimuth orientation of said aerial propeller;

below the bottom of said floating unit, at least one nautic propeller screw having a substantially horizonal shaft;

pitch variation means actuating on said nautic propeller screw;

a transmission system connecting said aerial propeller shaft to said nautic propeller shaft for transmitting the mechanical energy from said nautic propeller to said aerial propeller or from said aerial propeller to said nautic propeller and including a toruqe conversion means for selecting, during operations, the transmission ratio;



means for reversing the relative rotation direction of said aerial and nautic propellers to facilitate a change of function respectively from an aerogenerator to a propulsive function for said aerial propeller and from a propulsive to an energy collecting turbine function for said nautic propeller;

a directional means for insuring the steering of said floating unit and

control devices comprising means actuating in addition upon said directional means, said azimuth orientation of said aerial propeller and said rotation directions, upon at least two of three variable parameters of said system, namely the pitch of said aerial propeller, the transmission ratio and the pitch of the nautical propeller.

4,371,347

WAVE MOTOR, ESPECIALLY FOR PROPULSION OF BOATS

Einar Jakobsen, Roven, N-1920 Sorumsand, Norway

Filed Apr. 3, 1980, Ser. No. 136,918

Claims priority, application Norway, Apr. 4, 1979, 791132

Int. Cl.³ B63H *19/02*

U.S. Cl. 440—9 **5 Claims**

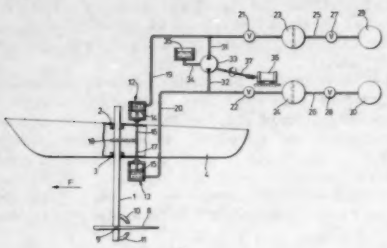
1. A wave motor for propulsion of a floating device, especially a watercraft, comprising:

a downwards extending supporting structure connected to said craft;

an essentially horizontally disposed, platelike tilting element which, at a forward portion thereof, as viewed in the cruising direction, is pivotally connected to the lower end of said supporting structure, to effect a tilting movement as a result of relative movement between the tilting element and the surrounding water when said craft if raised and lowered due to wave action;

a means being arranged on said supporting structure to limit the tilting movement of said element;

a means enabling said supporting structure to effect an essentially vertical movement in relation to said craft; and



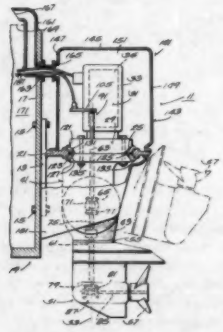
a means to keep said supporting structure in an intermediate position and return it to said position when it has been moved away from said intermediate position by influence of wave forces.

4,371,348

MOUNTING FOR MARINE PROPULSION DEVICE LOCATED AFT OF BOAT TRANSOM

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 18, 1980, Ser. No. 188,323
Int. Cl.³ B63H *5/12, 21/26*
U.S. Cl. 440—52 **14 Claims**



1. A marine propulsion device comprising a bracket adapted to be fixed relative to the transom of a boat, said bracket including an opening extending generally horizontally when said bracket is boat mounted, and a marine propulsion unit including an assembly extending through said opening and being fixed relative to said bracket, said assembly comprising a power head located above said bracket and including an internal combustion engine, and an upper housing located below said bracket, said marine propulsion unit also including a lower housing connected to said upper housing for pivotal movement therebetween about a tilt axis which is horizontal when said bracket is boat mounted, a gear case assembly connected to said lower housing for pivotal movement therebetween about a steering axis which is transverse to said tilt axis, a propeller rotatably carried by said gear case assembly, and a drive train connected to said propeller and said engine and extending through said gear case assembly and said lower and upper housings.

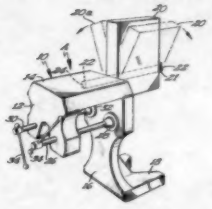
13. A marine propulsion installation comprising a boat hull including a transom, a propulsion device including a lower unit, means adapted to be connected to the transom for supporting said lower unit from the transom for vertical swinging movement about a horizontal axis, and a power head compartment which is located above said lower unit and aft of said transom, and which is substantially closed and has an interior housing an internal combustion engine located above said horizontal axis, and a duct extending through said transom and communicating between the atmosphere forwardly of said transom and the interior of said power head compartment.

4,371,349

TILT MOUNT FOR MOUNTING AN OUTBOARD MOTOR ON THE SIDE OF A CANOE

Howard W. Edwards, 705 24th St., Cloquet, Minn. 55720

Filed Mar. 16, 1981, Ser. No. 244,099
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—56 **9 Claims**



1. A tilt mount for mounting an outboard motor on the side of a canoe or the like comprising, in combination:

(a) a bracket,

(b) means for securing the bracket to a portion of a canoe,

(c) a motor mounting member on which an outboard motor is secured,

(d) means pivotally mounting said motor mounting member on said bracket including:

(A) a pin mounted on said bracket having one end extending from the bracket and a second end extending freely through

(B) a hole formed in said motor mounting member,

(e) said bracket having a stop member extending therefrom and against which a shaft of a motor normally engages when it is secured on said motor mounting member, said motor mounting member and a motor thereon tilting upwardly when the lower portion of the motor strikes an underwater object.

4,371,350

MARINE VESSEL WITH PROPELLER

Claus Kruppa, Berlin, and Wolfgang Wührer, Ravensburg, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,381
Claims priority, application Switzerland, Jan. 28, 1980, 656/80
Int. Cl.³ B63H *5/16*
U.S. Cl. 440—69 **7 Claims**

1. A marine vessel comprising:

a hull having a floor portion;

a tunnel provided at the floor portion of said hull;

at least one propeller which is located essentially throughout approximately one-half of its circumference within said tunnel;

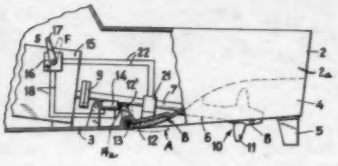
said tunnel extending in the lengthwise direction of said hull;

said tunnel possessing a flow-favorable cross-sectional configuration which follows flow lines of the water;

an adjustable control plate located forwardly of said propeller at a transition region between a surface of the floor portion and said tunnel;

means for adjusting said control plate between a first position and a second position;

said control plate when in said first position merging with the surface of said tunnel and permitting a streamlined shaped flow of the water through said tunnel so that said propeller is substantially fully immersed in the flow of water; and



said control plate, when in said second position, being extended and spaced from the surface of the tunnel and causing detachment of the water flow from the surface of the tunnel so that said propeller is only semi-immersed in the flow of water.

4,371,351

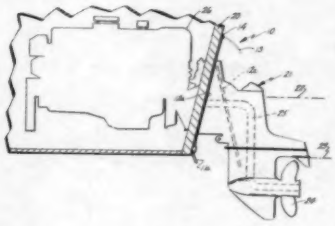
MARINE STERN DRIVE COOLER

Gordon Tousey, 1856 Southwood, Muskegon, Mich. 49441

Filed Feb. 9, 1978, Ser. No. 876,345

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—88 **2 Claims**



1. A cooling apparatus for supplying cooling water to a marine stern drive for a marine vessel said drive being driven by an inboard motor and contained within a housing including:

a water pickup means, means for mounting the said water pickup means below the level of the bottom of the marine vessel with an opening facing toward the front of the marine vessel for receiving the cooling water as the marine vessel proceeds forwardly;

a water transfer tube means separate and apart from said stern drive and inboard motor and extending upwardly along the transom of the marine vessel to a position above said stern drive, said tube means being connected to said water pickup means for passing the received cooling water generally upwardly to a position substantially above the stern drive; and

dispensing means including an outlet port with said water transfer tube means, said outlet port being located above and directed toward the top of said stern drive for directly passing the cooling water picked up by said water pickup means through said water transfer tube means and over the top of said stern drive housing so that cooling water runs down around the exterior surfaces of said housing for cooling the marine stern drive.

4,371,352

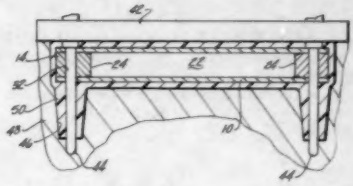
WATER SKI TOW HANDLE

Dennis P. Holland, 3599 Orchard Lake Rd., Orchard Lake, Mich. 48033

Filed Jan. 14, 1981, Ser. No. 225,025

Int. Cl.³ A63C *5/00, 9/00, 11/00, 15/00*

U.S. Cl. 441—69 **10 Claims**



1. A water ski tow handle comprising:

an elongated tubular cylindrical core bar,

a pair of cylindrical plugs, each plug having an outside diameter larger by a predetermined amount than the inside diameter of said core bar, said plugs being press fit into the opposite ends of said core bar so that said plugs sealingly engage the inner bore of the core bar and form a flotation chamber within the core bar,

said core bar including a hole formed transversely through each end and wherein each transverse hole extends diametrically through at least a portion of one of said plugs,

a resilient covering encasing said core bar,

wherein each transverse hole is dimensioned to receive a member therein, and

wherein said core bar is encased with said resilient covering at an elevated temperature and under high pressure conditions, said member securing said plugs against movement with respect to said core bar while said core bar is encased with said resilient covering and being subsequently withdrawn therefrom.

4,371,353

LIFE JACKETS

Peter J. Hume, 19-23 Tennyson St., Wellington, New Zealand

Continuation of Ser. No. 25,106, Mar. 29, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,508

Claims priority, application New Zealand, Mar. 31, 1978, 186849

Int. Cl.³ A63C *9/08*

U.S. Cl. 441—117 **6 Claims**

1. A non-inflatable life jacket comprising a continuous length of buoyant material which is substantially conformable to the shape of the wearer which when unconformed includes substantially centrally of the longitudinal length thereof an integral offset arced region configured to allow the same to deform and be conformed to encompass the nape and sides of the wearer's neck with the end regions of said buoyant material extending alongside each other down at least the wearer's chest to form front portions, said arced region being formed by an inner concave curve and an outer convex curve, said curves being substantially semicircular and having substantially the same radius, said end regions being substantially rectangular in shape and substantially aligned in the unconformed position, said inner concave curve being substantially tangential to the

plane including the edges of said end regions at which said outer convex curve terminates,

means to retain said buoyant material substantially in the conformed condition for wearing, and

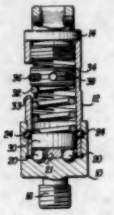
means to hold said buoyant material to the wearer so as in use to support his weight comprising means encircling the wearer's back which holds said end regions to his front.

4,371,354

CONTROLLED-TORQUE APPARATUS

John A. McKean, Fairview, Pa., assignor to Titan Tool Co., Fairview, Pa.

Filed Dec. 29, 1980, Ser. No. 221,322
Int. Cl.³ F16D 3/56
U.S. Cl. 464—36 **7 Claims**



1. A controlled torque apparatus comprising:

a first substantially cylindrical member having an open end, a closed end and a sidewall;

a second substantially cylindrical member having a closed end and a sidewall, the closed end of said second cylindrical member fitting within the open end of said first cylindrical member;

torque overload-responsive clutch means interposed between said first and second cylindrical members;

means for securing said second cylindrical member within said first cylindrical member, said securing means connecting said first cylindrical member to said second cylindrical member so that said first cylindrical member is longitudinally fixedly secured to said second cylindrical member but rotatable relative thereto and comprises:

an aperture through the sidewall of said second cylindrical member;

a ball bearing disposed in said aperture, the sidewall of said second cylindrical member having a thickness less than the diameter of the ball beaing;

an annular bearing race formed on the inner surface of the sidewall of said first cylindrical member corresponding to said aperture; and

ball bearing retaining means located within said second cylinder to retain said ball bearing in said aperture.

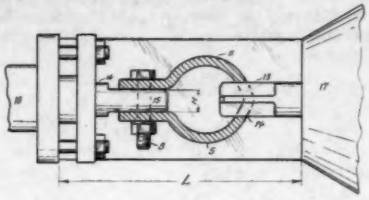
4,371,355

FLEXIBLE AND BACKLASH FREE ROTARY STEM COUPLING

Hans D. Baumann, P.O. Box 471, Rye, N.H. 03870

Filed Nov. 28, 1980, Ser. No. 211,046
Int. Cl.³ F16D 3/52
U.S. Cl. 464—101 **2 Claims**

1. Flexible and backlash free rotary stem coupling consisting of a semi-circular metal strip having flattened flange-like terminating ends, each of these flange-like terminating ends having openings that accomodate fasteners suitable to force each of the flange-like portions towards each other and thereby causing a clamping action against flattened stems, the portion of the semi-circular metal strip lying opposite and between said flange-like configurations has a pierced opening, said flange-like portions being separated by a wedge-like gap when the fastening devices are disengaged and being capable of assuming a parallel separation from each other upon tightening of said fasteners and following a deformation of the semi-circular metal strip, and wherein such deformation of the semi-circular



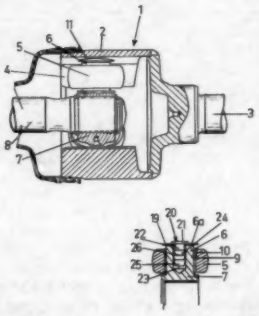
metal strip is capable of simultaneously reducing the size of the pierced opening to cause gripping action around shafts or rotating stems.

4,371,356

SLIDING UNIVERSAL JOINTS, PARTICULARLY FOR AUTOMOBILE TRANSMISSIONS

Jacques P. Dore, Colombes, France, assignor to Automobiles Peugeot and Automobiles Citroen S.A., both of Velizy, France

Filed Apr. 8, 1980, Ser. No. 138,437
Claims priority, application France, Apr. 12, 1979, 79 09277
Int. Cl.³ F16D 3/26
U.S. Cl. 464—111 **9 Claims**

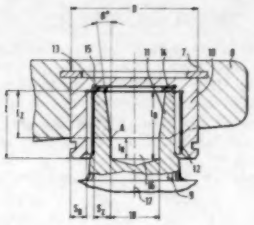


1. A sliding universal joint, particularly for automobile transmissions, comprising a driving element essentially in the form of a socket connected to a driving shaft, said socket having at least two roller tracks composed respectively of two cylindrical grooves, at least two rollers of partial spherical curvature mounted by their bores on trunnion pins of a hub connected to a driven shaft, said rollers being axially slidable on said pins and engaging in said tracks, and means for preventing said rollers from sliding off the trunnion pins during assembly of the universal joint, and for permitting said rollers to slide on the trunnion pins after assembly of the joint, said means comprising friction means tightly frictionally gripping each trunnion pin against displacement of the friction means by centrifugal force during rotation of the universal joint and abutment means supported by said friction means in spaced relation to an outside end of each roller, and engageable by the roller, to prevent the roller from sliding off its trunnion pin during assembly of the universal joint.

4,371,357
UNIVERSAL JOINT

Miloslav Petrzelka, Much-Kranüchel, and Werner Krude, Siegburg-Kaldauen, both of Fed. Rep. of Germany, assignors to Uni-Cardan AG, Siegburg, Fed. Rep. of Germany

Filed Jun. 25, 1980, Ser. No. 162,741
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934630
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—128 **2 Claims**

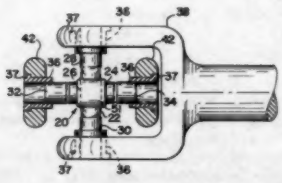


1. In a universal joint including yoke means having yoke bore means, trunnion cross means including generally cylindrical trunnion means operatively supported in said yoke bore means and defining a generally centrally disposed axis thereof, bearing bush means interposed within said yoke bore means between said trunnion means and said yoke means and means defining a bore extending into said trunnion means from an end face thereof in generally coaxial relationship with said axis, the improvement comprising that said trunnion means has a wall thickness S_Z surrounding said bore, that said bearing bush means has a wall thickness S_B surrounding said trunnion means, that said wall thickness S_Z is at least equal to the wall thickness S_B but smaller than triple the wall thickness S_B, that said bearing bush means is formed with a cylindrical inner surface having a depth 1 within which said trunnion means is received, that said bore in said trunnion means is formed with a depth 1_B which is at least as large as said depth 1, that said bore is formed with a conical wall portion extending to said end face of said trunnion means, and that said conical wall portion extends at an angle β relative to said axis, said angle β being at least 0.5° but smaller than 5°.

4,371,358
UNIVERSAL JOINT AND METHOD OF MAKING

Charles E. Laue, Wilmette, Ill., assignor to Hamilton-Pax, Inc., Chicago, Ill.

Filed Jun. 13, 1980, Ser. No. 159,211
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—136 **6 Claims**

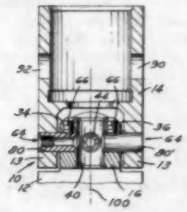


1. In a universal joint, an elongated, steel female member having a cylindrical central portion with a transverse cylindrical hole extending therethrough, said member having smaller-diameter cylindrical end portions coaxial with said central portion, said end portions being harder than said central portion and being finished to define smooth bearings, an elongated, steel male member with a central cylindrical portion complementary to and having a tight fit in said hole to define with said female member a cruciform spider consisting solely of said members, said male member having hardened cylindrical end portions finished to define smooth bearings coaxial with the central portion of the male member, the axis of the female member bearings being substantially normal to the axis of the male member bearings, said central portion of the female member being more ductile than its end portions to avoid cracking said central portion of the female member as the central portion of the male member is tightly fitted into said hole.

4,371,359
UNIVERSAL JOINT

Michael J. Brennan, Lake Orion, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 15, 1980, Ser. No. 216,396
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—136 **3 Claims**

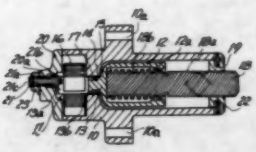


1. In a universal joint, the combination of opposite bifurcated joint members, each of said bifurcated joint members having a bore therethrough, a joint block having a plurality of extended bores in the sides of said block 90 degrees from each adjacent extended bore and intersecting the centerlines of each adjacent extended bore, a plurality of bores threaded from the top surface portion of said block to said extended bores, a pin mounted in each of said bores extending through said bores of said bifurcated joint members and through said extended bores of said block and a set screw threaded into each of said top bores to maintain a locking relationship with each of said pins mounted in each extended bore, each said pin having a longitudinal bore therethrough with a threaded portion to threadably receive a screw for joint disassembly by punching the screw instead of the pin with the associated set screw unlocked.

4,371,360
LOCKING MECHANISM IN TENSION PROVIDING DEVICE

Juji Ojima, Ebina, and Koichi Yamamuro, Hatano, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Oct. 10, 1980, Ser. No. 195,763
Claims priority, application Japan, Oct. 12, 1980, 54-131570
Int. Cl.³ F16H *7/08*; F01L *1/00*
U.S. Cl. 474—111 **2 Claims**



1. In a tension providing device wherein a first shaft is

threadedly engaged with a second shaft and a rotation force of said first shaft is changed to a pushing force in an axial direction of the second shaft, a locking mechanism for preventing rotation of said first shaft which comprises:

a slit groove formed at an axial end of said first shaft facing away from said second shaft;

casing means encompassing said end of said first shaft facing away from said second shaft;

lid means for covering a portion of said casing means including the axial end having a slit groove of said first shaft, said lid means having a threaded hole extending therethrough at a position eccentric from the axial center of said first shaft; and

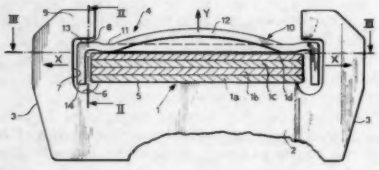
a stopper pin removably insertable into said slit groove at a position eccentric from the axial center of said end, said stopper pin having a control portion formed at one end, a projected portion for prevention of slipping out thereof which protrudes to the side formed at another end of said stopper pin, and a threaded portion extending between said control portion and said projected portion, said control portion being positioned outside of said casing, said threaded portion being engaged with said threaded hole of said lid, and said projected portion being inside of the casing, said another end of said stopper pin being engageable with said slit groove of the first shaft at the position eccentric from the axial center by operation of the control portion.

4,371,361

METAL BELT FOR DRIVE TRANSMISSION

Dante Giacosa, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Oct. 10, 1980, Ser. No. 195,804
Int. Cl.³ F16G *5/16*
U.S. Cl. 474—201 **6 Claims**



1. A continuous metal belt for drive transmission between V-groove pulleys, comprising:

a flexible loop constituted by at least one metal band and acting as a guide, and

a plurality of V-shaped blocks lodged on said loop and having respective recesses in which the loop is engaged, said blocks being slidable longitudinally on said loop to transmit the drive, wherein the improvement consists in:

said recess of each said block being defined by two lateral guide walls having free edges, said free edges being provided with respective retaining projections having active surfaces facing said band, and

a plurality of channel elements being arranged with their bottoms extending between said band and said active surfaces, and their sides between said lateral guide walls and respective edges of said band.

4,371,362

TRACK ROLLER SYSTEM

F. Hoyt Dorris, 516 Rocky Point Rd., Cordova, Tenn. 38018

Filed Apr. 2, 1980, Ser. No. 136,680
Int. Cl.³ B62D *55/14*; B60B *7/04*
U.S. Cl. 474—198 **5 Claims**

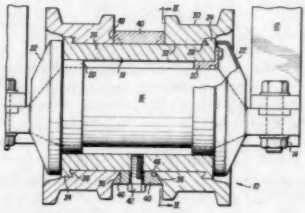
1. A track roller for an endless track vehicle, the roller comprising:

(a) a hub having a longitudinal axis of rotation, a central outer surface area, and opposite axial end areas;

(b) hub locking surfaces at each hub end area, said hub locking surfaces extending generally radially outwardly from the hub central outer surface area;

(c) a replaceable rim assembly on the hub, the assembly comprising two groups of arcuate rim segments axially spaced on the hub, each segment having axially and radially extending side faces, the segments of each group forming an annular track roller rim half when joined together about the hub with said faces adjacent or abutting each other;

(d) said rim segments having interior surfaces adapted to lie adjacent the hub outer surface, said interior surface including axially spaced inner and outer surface portions, said inner surface portions corresponding in shape to and adapted to fit over the hub central outer surface area, and said outer surface portions including generally radially outwardly extending rim locking surfaces adapted to engage said hub locking surfaces to provide an interference fit between said locking surfaces for preventing axial



outward movement of each assembled track roller rim segment with respect to the hub, said rim segments including generally radially extending inner end faces, and said hub and rim locking surfaces also extending in a generally axial direction towards the central section of said hub; and

(e) a removable retainer means arranged to fasten at least the ends of said rim segments opposite said rim locking surfaces relative to the hub and comprising a plurality of segments located within and spanning the axial space along the hub between said rim assemblies, and said retainer means including generally radially extending end surfaces that engage said inner end faces of said rim segments, said inner end faces of said rim segments and said end surfaces of said retaining means defining cam and follower surfaces;

(f) removable fastener means for securing the retaining means relative to the hub;

(g) said cam follower surfaces arranged to urge axially opposite rim segments axially apart towards said hub end areas when said removable fastening means is secured; and

(h) rotation preventing key means for locking said rim segments against rotation relative to said hub.

4,371,363

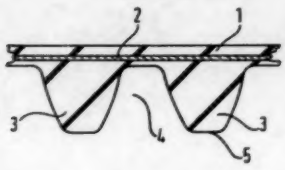
TOOTHED BELT

Mario Cicognani, Milan; Giorgio Tangorra, and Gianfranco Cimatti, both of Monza, all of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed May 14, 1980, Ser. No. 149,157
Claims priority, application Italy, May 25, 1979, 22973 A/79
Int. Cl.³ F16G *1/28*
U.S. Cl. 474—205 **7 Claims**

1. A toothed belt for meshing with a toothed pulley of a power transmission system comprising: an endless elastomeric or plastic tape, a plurality of parallel and coplanar cords embedded in the tape and disposed along the larger dimension of the tape, and a toothing on at least one face of said tape, the said toothing being formed by a plurality of teeth, separated

one from the other by hollow spaces, characterized by the fact that the profile of each tooth is a curve defined by the trigonometric tangent of the angles formed between the straight lines tangent to the curve and the straight line parallel to the tooth base that increase linearly from the tooth top towards the tooth base, and according to a constant coefficient (K) that is a function of the mechanical characteristic of the material forming the tooth and of the dimensions of the tooth calculated from the formula:



$$K=32h/(A+4\delta)^2$$

where:

K is the coefficient constant;

A is the width of th tooth base;

h is the height of the tooth;

δ is a coefficient as a function of the maximum admissible shearing stresses of the material forming the tooth and of the average modulus of the shear stresses of the material that constitutes the tooth.

4,371,364

METHOD FOR THE MANUFACTURE OF A PRINTED, PRE-CREASED PACKING MATERIAL WEB PROVIDED WITH OPENING INDICATION

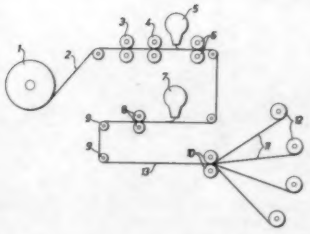
Hans A. Rausing, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Sep. 18, 1980, Ser. No. 188,469

Claims priority, application Sweden, Sep. 26, 1979, 7907976

Int. Cl.³ B31B *1/18, 1/88*

U.S. Cl. 493—7 **5 Claims**



1. A method for the manufacture of a packing material web, comprising the steps of providing a first web of a base layer material having a width which is a multiple of the width of said packing material web with a crease-line pattern for facilitating folding of said packing material web into packages, providing perforations adapted to form emptying openings on the packages manufactured from the packing material web, printing guiding marks consisting of markings printed in a dark color and adapted to be sensed by photoelectric arrangements onto said first web during the impression of the crease-line pattern, said guiding marks in number and in location being arranged such that each portion of the width of the first web that constitutes a single partial web receives corresponding guiding marks, coating said first web, after the crease-line pattern and perforations have been provided, on both sides with thermoplastic material, cutting the first web thus coated with thermoplastic material in a longitudinal direction to form a number of separate partial webs, each of the partial webs having a width corresponding to the width of at least one of the desired packing material webs, subsequently separately providing each of the partial webs in separate printing operations with decoration and text, controlling the printing operations by reference to the guiding marks, operating the printing operations at a substantially slower speed than the other operations, and rolling the printed webs into magazine rolls of a predetermined size.

4,371,365

APPARATUS FOR FITTING AND STACKING BAGS ONTO PINS

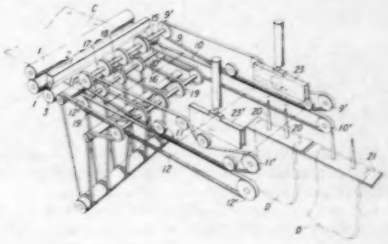
Hiromichi Shingo, Yokohama, Japan, assignor to Toyo Shokuhinkikai Kabushiki Kaisha, Yokohama, Japan

Filed Aug. 11, 1980, Ser. No. 176,644

Claims priority, application Japan, Aug. 31, 1979, 54/111251

Int. Cl.³ B31B *1/98*

U.S. Cl. 493—25 **5 Claims**



1. An apparatus for fitting and stacking bags on pins, comprising:

a pair of upper and lower feed rollers for gripping and intermittently feeding a film folded double to leave a lip portion having a pair of holes therein;

a sealing knife and a sealing roller disposed opposing each other on the front side of the front portions of said feed rollers and for quickly sealing and cutting said doubled film at the regular intervals between the intermittent feed motion of said feed rollers, and thereby forming bags in regular sequence;

two pairs of pick-off belts, each pair consisting of upper and lower belts, one pair of said belts being extended forward from positions in front of one end portion of said sealing knife and sealing roller, the other pair of said belts being extended forward from positions in front of the other end portion of said sealing knife and sealing roller, said two pairs of belts being so disposed as to grip both end portions of the bag;

an intermittent driving means for stopping said pick-off belts when the bag is being gripped thereby at starting end portions thereof and when the bag in a gripped state has been fed to terminal end portions thereof;

means for raising the starting end portions of said upper pick-off belts when the bags are fed;

a pair of pushers provided on the inner side of the terminal end portions of said two pairs of upper and lower pick-off belts, for releasing the bag from said belts;

a pair of wicket pins, positioned under the one of said pushers that is on the side of the lip of the bag, on which the paired holes in the lip of the bag may be fitted;

an intermittent transfer means for transferring said wicket pins when a predetermined number of bags have been stacked thereon;

first regulator means for adjusting the relative positions of

said wicket pins and the holes in the lip of the bags in the direction normal to the bag-feeding direction, in the plane of the bags, automatically as the bags are advancing;

second regulator means for adjusting the relative positions of said wicket pins and the holes in the lips of the bags in the bag-feeding direction while the apparatus is in operation.

4,371,366

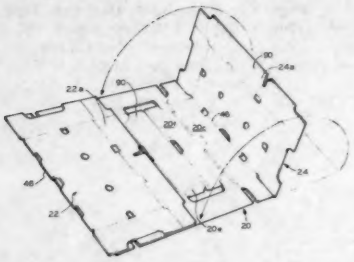
METHOD FOR MAKING A PRODUCE TRAY

Thomas E. Bower, Long Beach, Calif., and John J. Aust, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1980, Ser. No. 219,005

Int. Cl.³ B65P *5/36*

U.S. Cl. 493—138 **3 Claims**



1. A method for forming a one piece two-tray open top container for produce and the like from a single layer rectangular blank of corrugated board, including the steps of:

dividing the rectangular blank by two transverse fold lines into a central section extending one half the length of the rectangular blank and having four transversely extending central panels, and two end sections each extending approximately one quarter of the length of the blank and each including one transversely extending end panel;

folding the end sections on such fold lines into flat abutting relationship with the central section, thereby bringing the terminal edges of the end sections into parallel proximity adjacent the center of the central section, and bringing each end panel into surface abutting relationship with one of said central panels;

glueing each of said end panels to the abutting central panel; and

folding the two glued pairs of said end panels and said central panels into surface abutting relationship, thereby forming a quadruple layer central divider panel extending between said central section and said end sections with said central and end sections respectively forming a top wall and a bottom wall of the container.

4,371,367

APPARATUS FOR PULLING OPEN TUBE SECTIONS TO FORM BASE SQUARES IN THE PRODUCTION OF CROSS-BOTTOM SACKS

Fritz Achelpohl, Lengerich, and Werner Decker, Ladbergen, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 171,803

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931607

Int. Cl.³ B31B *1/52, 1/80*

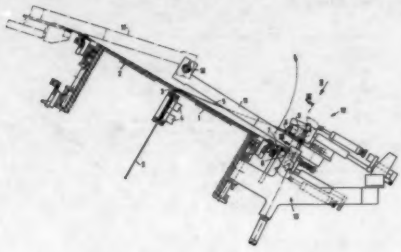
U.S. Cl. 493—256 **17 Claims**

1. Apparatus for pulling open elongated flexible tube sections in the production of cross-bottom sacks to form base squares having folded edges and corner squares, said apparatus comprising:

a table plate with opposed sides and a central slot for guiding and holding said tube section, said tube section projecting beyond said central slot to provide a margin of sufficient length for forming said base squares;

suction means which initially pull open one end of said tube section and then hold said tube section in a pre-opened position;

first and second grippers centrally located between the



opposed ends of said tube section, said first gripper being secured to said apparatus frame and said second gripper being secured to a pivotable structure, said pivotable structure being pivoted to said apparatus frame and being provided with a power means for swinging said pivotable structure through approximately 180° between the opposed sides of said table plate.

4,371,368

METHOD AND APPARATUS FOR THE MANUFACTURE OF FUSECORD

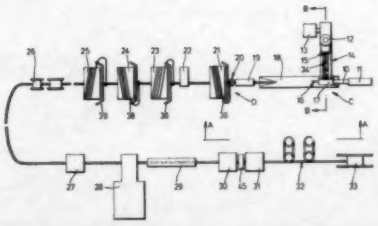
Robert M. Aitken, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 7, 1980, Ser. No. 109,903

Claims priority, application United Kingdom, Jan. 24, 1979, 7902492

Int. Cl.³ C06C *5/08*

U.S. Cl. 493—298 **7 Claims**



1. A method of helically spinning stranded reinforcing wrapping material on explosive fusecord comprising continuously advancing an encased fusecord core along a horizontal path axially through a plurality of supply reels on each of which wrapping material is wound coaxially with said horizontal path, said reels being spaced apart and freely mounted for rotation about a common axis, and training at least one strand of wrapping material from each reel helically around the said encased fusecord core by engaging the strand with a flyer rotatable around the encased fusecord and rotatably driving the flyer and the reel at the respective rotational speeds required to wrap the desired amount of wrapping material on the advancing fusecord.

4,371,369

AUTOMATIC REGISTER SYSTEM FOR DIE CUTTING OPERATIONS

Vester L. Wright, III, Indianapolis, Ind., assignor to Franklin Corrugated Design, Inc., Franklin, Ind.

Filed Apr. 25, 1980, Ser. No. 143,920
Int. Cl.[3] B31B *1/74*
U.S. Cl. 493—373 9 Claims

1. A stripping assembly for in-line stripping apparatus of stripping stations in die cutting systems comprising:

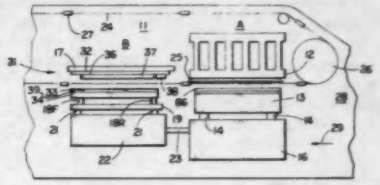
a stripping die including a generally planar mounting member and waste stripper means on said mounting member;

a template including a planar member shaped to provide support for non-scrap areas of a work piece to be stripped; and

fastener means retaining the mounting member and template in alignment when the assembly is separate from the stripping station of the system;

said stripper means including stripper blocks secured to said template, and said fastener means including:

a plurality of lock-up plates secured to said stripper means and said template; and



means securing said lock-up plates to said stripper means and said template.

4,371,370
OXIDATION HAIR DYES COMPRISING BIS-(2,4-DIAMINOPHENOXY)-ALKANOLS AS COUPLING COMPONENTS

David Rose, Hilden; Hinrich Möller, Düsseldorf, and Norbert Maak, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

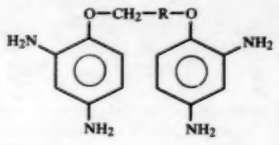
Filed Mar. 4, 1981, Ser. No. 240,393

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011191

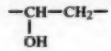
Int. Cl.³ A61K *7/13;* **C07C** *93/14*

U.S. Cl. 8—408 **7 Claims**

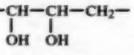
1. A compound of the formula



where R is selected from the group consisting of the radicals



and



or a salt thereof with an inorganic or organic acid.

2. A composition of the developer-coupler type for the dyeing of the hair, consisting essentially of a carrier, at least one compound of claim 1, as coupling component, and, as developer component, one or more oxidative dye developer components, said coupler and said developer being present in a molar ratio of from about 2:1 to 1:2.

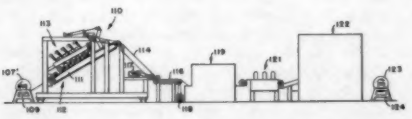
4,371,371
PROCESS FOR DYEING TEXTILE MATERIALS IN SOLID SHADES

Joseph J. Smrekar, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 15, 1981, Ser. No. 273,369

Int. Cl.³ D06P *3/82;* **D06B** *1/02*

U.S. Cl. 8—531 **9 Claims**



1. A process for dyeing textile materials in a solid shade with a jet injection dyeing apparatus, including conveying means for transporting the textile, jet orifices for delivering dye to said textile material, and control means for supplying data to control the operation of the application of dye from the jet orifices to the textile material, which comprises the steps of: modifying the textile material prior to dyeing of same by applying to said textile material an aqueous admixture containing an effective minor amount of a thickening agent to maintain the viscosity of said aqueous admixture at from about 150 to about 750 centipoises to thoroughly wet said textile material; dyeing said textile material in a solid shade with an acid dye composition having a viscosity of from about 150 to about 750 centipoises by applying said dye composition by means of said jet dyeing apparatus in an amount of at least about 300 percent based on the weight of said textile material; the pH of the textile material at the point of contact between said dye-composition and said textile material being maintained at from about 3.5 to about 7.5, fixing said dye on said textile material, washing said textile material to remove any unfixed dye, and recovering a resulting textile material dyed in a solid shade.

4,371,372
SIMULTANEOUS DE-SIZING AND REACTIVE DYEING OF CELLULOSE TEXTILES

Karl-Heinz Weible, Aesch, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jun. 29, 1981, Ser. No. 278,210

Int. Cl.³ D06P *1/44, 3/66*

U.S. Cl. 8—543 **11 Claims**

1. A process which comprises the steps of (1) applying a cold-dyeing reactive dye and, as de-sizing agent, a bacterial α-amylase to a cellulose textile material at least some of whose fibers have been treated with a starch-based size, said α-amylase having significant activity at pH values above 8.5 and at temperatures below 30° C. and (2) subjecting the thus-treated material to the cold-dwell process until sufficient fixation of the dye has been achieved, whereby simultaneous de-sizing and reactive dyeing of the material is effected.

4,371,373
CHLORIDE OXIDATION OF DYES IN VAT AND SULFUR DYED TEXTILES

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France

Filed Jan. 3, 1979, Ser. No. 784

Int. Cl.³ D06P *1/24, 1/30, 5/00*

U.S. Cl. 8—650 **10 Claims**

1. In a process of oxidation of a dyeing made by application to textiles of a vat or sulfur dye in reduced form with sodium chlorite, the improvement wherein a chelating agent which prevents the release of chlorine or chlorine compounds is added to the chlorite bath and said oxidation is carried out in an acid medium at a pH of 3.5–6.5 and a temperature of 0°–90° C., said chelating agent being an amino polycarboxylic acid salt or an hydroxyalkane phosphonic acid salt.

4,371,374
MONITORING METABOLIC CONTROL IN DIABETIC PATIENTS BY MEASURING GLYCOSYLATED AMINO ACIDS AND PEPTIDES IN URINE

Anthony Cerami, Flanders, N.J.; Michael Brownlee, and Helen Vlassara, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,471

Int. Cl.³ G01N *33/50*

U.S. Cl. 23—230 B **26 Claims**

1. A method of monitoring blood glucose integrated over a period of time from about one week to about one month, separating and quantitating non-enzymatic glycosylated amino acids, peptides or mixtures thereof present in the patient's urine, comprising:

(a) treating a urine sample containing said non-enzymatic glycosylated amino acids, peptides or mixtures thereof with a suitable boronic acid to form a complex of said non-enzymatic glycosylated amino acids, peptides or mixtures thereof with said boronic acid;

(b) separating the so-formed complex from said urine; and

(c) analyzing the separated complexed material to establish the presence and amount of amino acids, peptides or mixtures thereof to obtain the complexed non-enzymatically

glycosylated amino acid content of the urine, which content provides an indicia of blood glucose integrated over a period of time from about one week to about one month.

13. A test kit for the colorimetric determination of non-enzymatically glycosylated amino acids and/or peptides in a urine sample, comprising:

(a) a predetermined amount of an insolubilized suitable boronic acid;

(b) a predetermined amount of a color dye reactive with amino acids by attachment of the dye to said non-enzymatic glycosylated amino acids and/or peptides, whereby (a) and (b) are separated from one another by being placed in separate containers; and

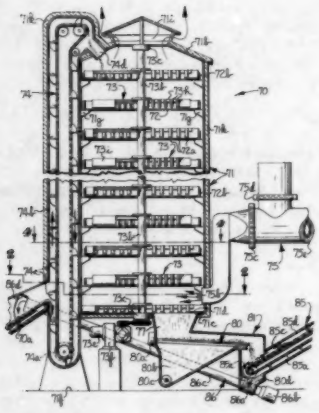
(c) previously prepared standards for colorimetric comparison.

4,371,375

APPARATUS AND PROCESS FOR DRYING SAWDUST

Silas P. Dennis, Jr., and Tony M. Dennis, both of P.O. Box 279, Albemarle, N.C. 28001

Filed Nov. 17, 1981, Ser. No. 322,179
Int. Cl.³ C10L 9/08; F26B 5/04
U.S. Cl. 44—2 **16 Claims**



1. A dryer apparatus for converting sawdust into a dry, highly combustible wood fiber fuel comprising an upright housing having a plurality of vertically spaced horizontal metal dryer plates therein, each of said plates having spaced-apart openings therein through which sawdust introduced at the top of the housing may successively pass downwardly to and through the plates, said openings in adjacent plates being staggered relative to each other so that the sawdust from one plate may not drop down through an opening thereof directly into an opening of the next lower plate whereby the sawdust moves downwardly in a sinuous path through the upright housing, said dryer apparatus further comprising:

upright rim means formed at peripheral portions of each of said dryer plates for preventing the sawdust from moving outwardly off of the plates,

sawdust agitator means associated with the respective dryer plates and comprising

rotating arms rotatable on a vertical axis and extending outwardly in overlying relation to each of the respective plates,

teeth means extending from the arms and terminating in close relationship to the underlying plate and serving for agitating the sawdust for enhancement of the drying thereof, and

plow means carried by the outer end portion of at least certain arms associated with at least certain plates for engagingly deflecting sawdust resting on the respective underlying plates toward the axis of the arms to overcome the outward migration imparted to the sawdust by the teeth and to further enhance the drying of the sawdust, said plow means comprising an elongate member having an outward leading end positioned inwardly of and closely adjacent said rim means and extending inwardly therefrom a predetermined distance to a trailing end, said plow means elongate member being angularly disposed with respect to said associated arm at an angle effective to deflect the sawdust inwardly,

means for permitting introduction of hot dry air into the dryer adjacent the lowermost dryer plate so that at least a substantial portion of the air may then flow upwardly through said staggered openings in the plates in a sinuous manner, and

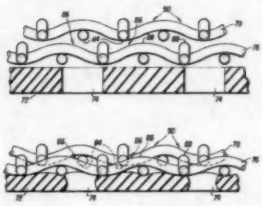
well means provided below said lowermost plate and in which the dried sawdust is received.

4,371,376

CONSOLIDATION OF SLURRIES OF SOLID PARTICULATE MATERIALS

Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Norwood Minerals, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1981, Ser. No. 274,540
Int. Cl.³ C10L 5/02, 5/00; B01D 33/00
U.S. Cl. 44—10 R **39 Claims**



21. A process for removing the liquid from a slurry of solid particulate material and for consolidating the particulate material into a shape-retaining slug, comprising

(a) placing a charge of said slurry in an enclosed consolidation chamber provided with drainage means for escape of the liquid from the chamber,

(b) interposing a porous structure between said slurry and said drainage means, said porous structure comprising

(i) a sheet of elastic material having a plurality of holes therethrough, wherein said sheet is disposed in said chamber so that the holes through said sheet communicate with said drainage means, and

(ii) two woven wire screens having the same plain weave and same mesh size, wherein one of said screens is disposed adjacent to said sheet of elastic material, and wherein said screens are disposed relative to each other so that when compressive stress is applied to the slurry in said chamber, the two screens are forced together against said sheet of elastic material so that the portions of the woven wires of one screen which face the other screen at the points where the wires of the first screen cross intimately engage the openings through the other screen,

(c) applying compressive stress to said slurry in said chamber, thereby causing said screens to intimately engage, removing liquid from said slurry through said drainage means, and consolidating said slurry into a slug.

22. The process of claim 21 wherein the two screens have a mesh size between about 300 mesh and about ¼ inch (U.S. Standard Sieve Series).

23. The process of claim 22 wherein said slurry is a slurry of

coal and the two screens have a mesh size between about 28 mesh and about 150 mesh (U.S. Standard Sieve Series).

4,371,377

FUEL ADDITIVE

Theodore Weinberger, Charlotte, N.C., assignor to Adriel Energy Corporation, McLean, Va.

Filed Nov. 26, 1980, Ser. No. 210,601
Int. Cl.³ C10L 1/02
U.S. Cl. 44—56 13 Claims

1. A gasoline additive mixture consisting essentially of alcohol mixed with from about 3 to about 10 percent, based on the volume of said alcohol, a ketone having the general formula

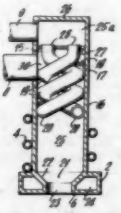
wherein R_1 and R_2, which may be the same or different, are each an alkyl of 1 to 4 carbon atoms, and from about 0.3 to about 1.5 grams per gallon of said additive mixture of an alkali metal carbonate in finely divided form.

4,371,378

SWIRL BURNER FOR PARTIAL OXIDATION PROCESS

Albert Brent, Huntington; Charles P. Marion, Mamaroneck, both of N.Y.; George N. Richter, San Marino, Calif.; William B. Crouch, Chappaqua; Edward T. Child, Tarrytown, both of N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, and a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Dec. 3, 1980, Ser. No. 212,054
Int. Cl.³ C10J 3/50
U.S. Cl. 48—86 R 32 Claims



1. A burner for mixing together separate feed streams to produce a multi-phase mixture for reaction in a partial oxidation gas generator comprising: a central bundle of open-ended helical tubes whose central longitudinal axis is coaxial with the central longitudinal axis of the burner and comprising one ring or a plurality of rings concentric with the central longitudinal axis of the burner of helical tubes with each individual helical tube having upstream inlet means passing perpendicularly through a tube sheet forming a gas tight seal therewith and in communication with conduit means by which a first reactant feed stream may be introduced and then split into a plurality of separate streams which pass down through said central bundle of helical tubes and are then discharged through the downstream ends of said tubes; a first coaxial cylindrical conduit concentric with and surrounding said central bundle of helical tubes, said first conduit being closed near the upstream end and forming a manifold means with said tube sheet located within said conduit below said closed end and said first conduit having an unobstructed circular downstream outlet at the tip of the burner comprising a converging frustoconical rear portion that develops into a right cylindrical front portion which terminates at the downstream face of the burner; upstream inlet means in communication with said first conduit through which a second reactant feedstream may be separately introduced and split into a plurality or swirling streams which may pass down through a plurality of related helical-shaped passages formed in the cylindrical space that surrounds the central bundle of helical tubes and/or through the interstices, between adjacent nontouching helical tubes, if any; and means for supporting the individual helical tubes in said central bundle of helical tubes with respect to said first conduit and each other; wherein the downstream tips of the individual helical tubes in said central bundle of helical tubes are retracted upstream from the downstream face of the burner a distance of 2 or more times the minimum diameter of said first conduit downstream outlet to provide a central pre-mix zone comprising at least one coaxial cylindrical shaped pre-mix chamber in series; and said first and second swirling reactant feed streams impinge together and are intimately mixed and said multi-phase mixture is produced in said central pre-mix zone prior to being discharged through said first conduit downstream outlet.

4,371,379

PARTIAL OXIDATION PROCESS USING A SWIRL BURNER

Albert Brent, Huntington; Charles P. Marion, Mamaroneck, both of N.Y.; George N. Richter, San Marino, Calif.; William B. Crouch, Chappaqua; Edward T. Child, Tarrytown, both of N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 212,054, Dec. 3, 1980, which is a continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Feb. 25, 1982, Ser. No. 352,444
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R 5 Claims

1. In a continuous process for the manufacture of gas mixtures comprising H_2, CO, CO_2 and at least one material selected from the group consisting of H_2O, N_2, A, CH_4, H_2S and COS by the partial oxidation of a reactant stream selected from the group consisting of a pumpable slurry of solid carbonaceous fuel in a liquid carrier, liquid or gaseous hydrocarbon fuel, and mixtures thereof with a reactant stream comprising a free-oxygen containing gas, with or without a temperature moderator selected from the group consisting of steam, liquid water, CO_2, N_2, cooled portion of product gas, and mixtures thereof; said partial oxidation reaction taking place in the reaction zone of a free-flow gas generator at an autogenous temperature in the range of about 1700° to 3500° F. and at a pressure in the range of about 1 to 300 atmospheres, the improvement which comprises;

(1) splitting one of said reactant streams called the first reactant stream with or without admixture with a portion of said temperature moderator into a plurality of separate streams by passing said first reactant stream through a central bundle of open-ended helical tubes which is supported within the central cylindrical conduit of a burner, said central conduit being coaxial with the longitudinal axis of said burner and having an unobstructed circular downstream outlet at the tip of the burner, wherein the downstream ends of said central bundle of helical tubes are retracted upstream from the burner face a distance of

about 2 or more times the minimum diameter of said circular outlet providing one or more cylindrical central pre-mix chambers in series in said central conduit where the mixing of said first and second reactant streams in (3) below takes place;

(2) simultaneously passing the other reactant stream called the second reactant stream with or without admixture with a portion of said temperature moderator through a plurality of related helical-shaped passages formed in the cylindrical space that surrounds said central bundle of helical tubes and/or through the interstices, if any, between said helical tubes;

(3) impinging and intimately mixing together said first and second reactant streams from (1) and (2) to produce a swirling mixture; and

(4) reacting the swirling mixture from (3) by partial oxidation in the reaction zone of said gas generator.

4,371,380
PRESSURE SWING ADSORPTION PROCESS

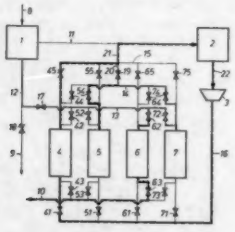
Christian Benkmann, Gräfelfing, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,241

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916585

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **9 Claims**



1. In a pressure swing adsorption process for the purification or separation of gaseous mixtures, using plural, cyclically reversible adsorbers, each of which passes through identical switching cycles, wherein each switching cycle comprises sequentially at least one adsorption phase, two expansion phases, a desportion phase, and a pressure buildup phase, the improvement comprising effecting desorption by purging with a foreign gas, following the desorption with a displacement phase, and conducting the displacement of the foreign gas with a gas or gaseous mixture discharged during an expansion phase.

4,371,381
GAS PURIFICATION PROCESS

Paul M. Schuftan, deceased, late of Edinburgh, Scotland (by Alice Schuftan, executrix), assignor to Cryoplants Limited, London, England

Filed Mar. 12, 1981, Ser. No. 243,173

Int. Cl.³ B01D *53/34*

U.S. Cl. 55—27 **10 Claims**

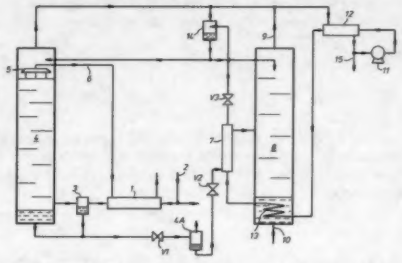
1. A method of purifying a gas mixture comprising between 10 to 60% carbon dioxide and at least one gaseous impurity of higher boiling point than carbon dioxide and at least one gas of lower boiling point than carbon dioxide, comprising the steps:

(a) precooling the gas mixture to the dew point of the carbon dioxide or below;

(b) rectifying the gas mixture in a first rectification column having a condenser and forming a liquid fraction relatively rich in the impurity or impurities and an uncondensed product gaseous fraction relatively lean in or free from the gaseous impurity or impurities, but containing a lower proportion of carbon dioxide than the gas mixture entering the first rectification column;

(c) cooling the condenser with liquid carbon dioxide at a pressure and temperature above the pressure and temperature of carbon dioxide at its triple point, whereby a majority of the carbon dioxide in the gas mixture is condensed and serves as reflux in the first rectification column;

(d) employing the uncondensed product gaseous fraction to precool the gas mixture in the said step (c);



(e) withdrawing the liquid fraction from the first rectification column; expanding the liquid fraction, and vaporising it;

(f) rectifying the vaporised liquid fraction in a second rectification column at a pressure and temperature higher than the pressure at the triple point of carbon dioxide and producing gaseous carbon dioxide substantially free of gaseous impurity and a tail liquid relatively rich in the gaseous impurity or impurities.

4,371,382
PROCESS AND APPARATUS FOR THE CONTACT AND SEPARATION OF IMMISCIBLE FLUIDS

Leon I. Ross, Grand Cayman, Cayman Islands, assignor to Caribbean Properties Limited, Grand Cayman, Cayman Islands

Continuation of Ser. No. 175,841, Oct. 2, 1980, Pat. No. 4,297,111, which is a continuation-in-part of Ser. No. 76,679, Sep. 19, 1979, abandoned, which is a continuation of Ser. No. 878,389, Feb. 16, 1978, abandoned. This application Jul. 7, 1981, Ser. No. 281,097

The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.

Int. Cl.³ B01D *47/16, 47/18*

U.S. Cl. 55—92 **46 Claims**

1. A process for the continuous contact of a denser fluid feed with a less dense fluid feed and the subsequent separation of a resultant denser fluid product from a less dense immiscible fluid product, the process comprising:

(a) introducing the denser fluid feed into an inner conduit, having a generally circular transverse section surrounding a central longitudinal axis, the conduit being open at one end to provide an outlet with a generally circular rim, centered upon the longitudinal axis of the conduit,

(b) directing the flow of the denser fluid feed through the inner conduit axially toward and through the outlet therefrom into a coaxial outer conduit, also having a generally circular transverse section, overlapping the inner conduit around and beyond the said circular rim, thus defining a generally annular section within the outer conduit where the inner conduit is overlapped thereby and a free section beyond the overlapped rim of the inner conduit, the said overlapped rim defining the outlet of the generally annular section,

(c) spinning the denser fluid feed around the longitudinal axis of the inner conduit fast enough to form the denser fluid feed emerging from the outlet of the inner conduit into a spinning

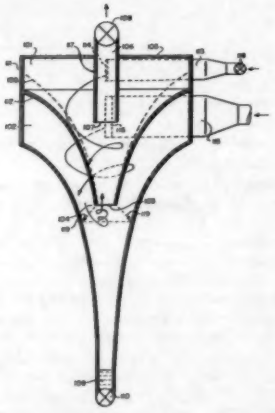
denser fluid ring connecting the overlapped rim of the inner conduit with the overlapping outer conduit, thereby curtaining off the outlet of the generally annular section from the free section of the outer conduit,

(d) introducing the less dense fluid feed into and through the generally annular section of the outer conduit and thence into the free section thereof through the outlet of the generally annular section curtained off by the spinning denser fluid ring, whereby the less dense fluid feed must be intercepted by the spinning denser fluid ring, the fluid feeds consequently interacting with one another within the outer conduit to yield immiscible fluid products differing in density from one another, the spinning fluid products separating centrifugally from one another with the less dense fluid product flowing toward an inner space closer to the longitudinal axis than the surrounding denser fluid product,

(e) withdrawing the less dense fluid product from the said inner space and

(f) separately withdrawing the denser fluid product from the outer conduit.

30. An apparatus for the continuous contact of a denser fluid feed with a less dense fluid feed and the subsequent separation of a resultant denser fluid product from a less dense immiscible fluid product, the apparatus comprising:



(a) an inner conduit, having a generally circular transverse section surrounding a central longitudinal axis, the conduit being open at one end to provide an outlet with a generally circular rim, centred upon the longitudinal axis of the conduit,

(b) a coaxial outer conduit, also having a generally circular transverse section, overlapping the inner conduit around and beyond the said circular rim, thus defining a generally annular section within the outer conduit where the inner conduit is overlapped thereby and a free section beyond the overlapped rim of the inner conduit, the said overlapped rim defining the outlet of the generally annular section,

(c) means for introducing the denser fluid feed into the inner conduit,

(d) means for directing the flow of the denser fluid feed through the inner conduit axially toward and through the outlet therefrom into the overlapping outer conduit,

(e) means for spinning the denser fluid feed around the longitudinal axis of the inner conduit fast enough to form the denser fluid feed emerging from the outlet of the inner conduit into a spinning denser fluid ring connecting the overlapped rim of the inner conduit with the overlapping outer conduit, thereby curtaining off the outlet of the generally annular section from the free section of the outer conduit,

(f) means for introducing the less dense fluid feed into and through the generally annular section of the outer conduit and thence into the free section thereof through the outlet of the generally annular section curtained off by the spinning denser fluid ring,

(g) an outlet for a resultant less dense fluid product from a location into which it is spun centripetally inward from the spinning fluid ring, and

(h) a separate outlet for a resultant denser fluid product from the outer conduit.

4,371,383

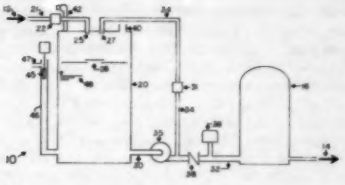
RADON REMOVAL SYSTEM

K. Lennart Rost, P.O. Box 23, Readfield, Me. 04355

Filed Jan. 12, 1981, Ser. No. 224,028

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—169 **6 Claims**



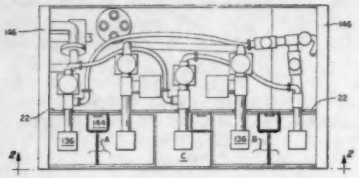
1. A radon gas removal system for installation between a well or other water source and a water use system comprising:

at least one reactor tank, first inlet means and first spray head means at the upper portion of said tank for spraying water from a well or other water source into said tank in a fine spray, outlet means comprising first and second outlet pathways at the base portion of said tank, said second outlet pathway comprising means for coupling to a water use system, second inlet means and second spray head means at the upper portion of said tank operatively coupled to said first outlet pathway for recycling and respraying the water in said tank, splash plate means supported in the tank for deflecting and dispersing water sprayed into the tank, pump means coupled at the outlet means, ventilation means including inlet and outlet vents at the top portion of said tank for venting released radon gas away from said tank, first valve means in the first inlet means, liquid level switch means operatively coupled to the tank and first valve means for closing said first valve means when the water level in the reactor tank reaches a specified level, second valve means in the outlet means first pathway, pressure switch means at the outlet means second pathway operatively coupled to the second valve means for closing said second valve means when pressure in the water use system falls below a specified pressure and for opening said second valve means when said specified pressure is restored, said pressure switch means also operatively coupled to the first valve means for opening said valve means when the pressure falls below the specified value, and timer means operatively coupled to said pump means and pressure switch means for activation by the pressure switch means to operate the pump means during a preset timer period whereby the reactor tank is regularly filled and maintained at a desired level, the pressure in a water use system coupled to the outlet means second outlet pathway is regularly restored and maintained at a desired level, and whereby water sprayed into the reactor tank is recycled and resprayed into the reactor tank during the preset timer period for removing and venting radon gas whenever the reactor tank is refilled.

4,371,384
BED VESSELS FOR A COMPACT OXYGEN CONCENTRATOR

Norman R. McCombs, Tonawanda, N.Y., assignor to Green & Kellogg, Inc., Tonawanda, N.Y.

Division of Ser. No. 84,305, Oct. 12, 1979, Pat. No. 4,302,224.
This application May 26, 1981, Ser. No. 266,867
Int. Cl.³ B01D 53/04
U.S. Cl. 55—179 5 Claims



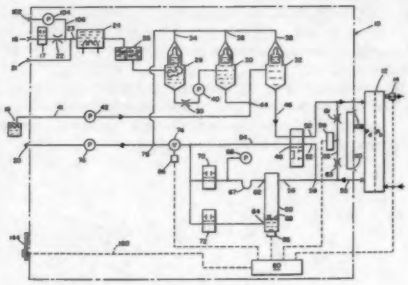
1. A machine for separating a constituent gas out of air using pressure swing adsorption, said machine including air compressor means, at least two closed vessels each containing a bed of adsorbent material, said adsorbent material preferentially adsorbing at least one of the constituent gases in the air, a plurality of solenoid valves being normally closed (no flow), control means for operating said solenoid valves in a cylical manner to achieve alternate adsorption of said at least one constituent gas in and purging of said at least one constituent gas out of said at least two beds of adsorbent material according to a pressure swing adsorption technique, each of said closed vessels comprising a predetermined length of imperforate rectilinear cross-section pipe as its body, means to close the ends of said length of pipe, means to mount said at least two lengths of pipe in a side by side fashion, adsorbent bed material substantially completely filling said vessels, means to permit the flow of gas through said end closing means, whereby said vessels may be arranged in closely spaced relation to each other to thereby permit said machine to be contained in a compact housing, said means to join and permit gas flow comprising a pan-like member at said one end of said at least two pipes with the ends of said pipes terminating short of the base of said pan-like member, whereby gas flow communication can be had between said one of said pipes through the space defined by said pan-like member.

5. A machine for separating a constituent gas out of air using pressure swing adsorption, said machine including air compressor means, at least one closed vessel containing a bed of adsorbent material, said adsorbent material preferentially adsorbing at least one of the constituent gases in the air, a plurality of solenoid valves to control gas flows into and out of said at least one vessel, all of said plurality of solenoid valves being normally closed (no flow), control means for operating said solenoid valves in a cyclical manner to achieve alternate adsorption of said at least one constituent gas in and purging of said at least one constituent gas out of said at least one bed of adsorbent material according to a pressure swing adsorption technique, said at least one closed vessel comprising a predetermined length of imperforate square cross-section pipe as its body, means to close the ends of said length of pipe, adsorbent bed material substantially completely filling said vessel, means to permit the flow of gas through said end closing means, said gas flow means comprising filter means joined to said end closing means, whereby a plurality of said vessels may be arranged in closely spaced relation to each other to thereby permit said machine to be contained in a compact housing, said vessel comprising a pair of substantially equal lengths of said pipe, means to join said pair together longitudinally side-by-side and to permit gas flow communication between said pipes at one end of the joined together pair with one of said gas flow permitting means in each of the end closing means at the other ends of the joined together pair, whereby the functional length of the adsorbent bed in said vessel is substantially equal to twice the length of one of said pipes and the physical length of said vessel is substantially equal to the length of one of said pipes, and said means to permit gas flow between said pipes at said one end of the joined together pair comprising a pan-like member sealingly joined to the said one-ends of said pair of pipes, whereby said gas flow communication is via said pan-like member.

4,371,385
DEAERATING LIQUID

Steven H. Johnson, Lakewood, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 28, 1981, Ser. No. 258,423
Int. Cl.³ B01D 19/00
U.S. Cl. 55—190 9 Claims



1. Apparatus for deaerating liquid supplied to a dialyzer comprising

first flow restriction means in a source supply line connected to a source of liquid to limit the flow rate through said line,

first deaeration chamber means having a liquid outlet, a liquid inlet connected to said source supply line downstream of said first flow restriction means, and an air outlet located above said liquid inlet and said liquid outlet,

a first positive displacement pump having an inlet connected to said liquid outlet of said deaeration chamber means, so that said deaeration chamber means is between said pump and said first flow restriction means, and an outlet connected to a dialyzer supply line and capable of pumping at a flow rate higher than the flow rate permitted by said first flow restriction means to lower the pressure of the liquid between said first pump and said first flow restriction means and cause volatilization of gases dissolved therein,

low pressure sink means connected to said air outlet, and

second flow restriction means connected between said liquid outlet of said deaeration chamber means and said first pump to raise the pressure at said liquid outlet to a level greater than that at said air outlet to cause volatilized gas collected within said chamber to flow through said air outlet and not through said liquid outlet.

4,371,386
FILTER HOUSING

Francisco DeVecchi, Farmington Hills, Mich., assignor to Veco International, Inc., Southfield, Mich.

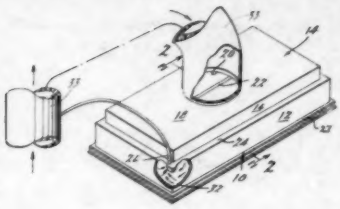
Filed May 18, 1981, Ser. No. 265,260
Int. Cl.³ B01D 46/10
U.S. Cl. 55—338 18 Claims

2. A device for sealably holding a filter, said device comprising:

a filter comprising at least one type of filtering material sealed in a frame surrounding and supporting said filtering material, said filter having an upstream side and a downstream side, wherein a knife-edge is embedded in said upstream side of said filter frame, said knife-edge forming

a substantially vertical protrusion from said upstream side of said filter frame,

and a filter holding device that is configured to contain a first side running around the periphery of said filter holding device to form an outer chamber wall, a lip that extends outwardly from the bottom of said first side, a channel bar that is clamped to said lip to form a chamber floor, and a chamber ceiling that extends inwardly from said first side and substantially parallel to said lip,



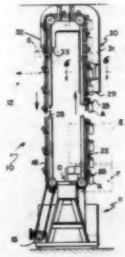
whereby said filter is inserted into said filter holding device to form a chamber around the periphery of said frame of said filter, said frame of said filter forming an inner chamber wall of said chamber, said chamber being connected to an air return for said filter thereby creating a vacuum within said chamber to remove any unfiltered air that bypasses said filter and leaks into said chamber.

4,371,387

METHOD AND APPARATUS FOR HANDLING GLASSWARE

Addison B. Scholes, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Aug. 3, 1981, Ser. No. 289,356
Int. Cl.³ C03B *35/12*
U.S. Cl. 65—118 **13 Claims**



1. A method of maintaining the strength of glass containers formed from a glass container forming machine comprising the steps of providing molten glass gobs to said machine, initially forming from said gobs finish portions for said containers, immediately forming from said gobs the remaining portions of said containers, transferring the fully formed containers in spaced relationship from each other while being held only at their initially formed portions to a moving cradle means proximate to said machine, said cradle means engaging only said previously held portions of the containers, allowing the newly formed containers to partially cool immediately following their formation, annealing said containers while so held including their bottoms whereby said containers are subjected to a controlled rate of cooling, and finally rapidly cooling the annealed containers to about ambient temperature while held by the initially formed portions.

13. An apparatus for manipulating glass containers newly formed from an individual section machine to maintain the inherent strength characteristics of said containers comprising means for passing molten glass gobs to said machine, means connected to said machine for intitially forming from said gobs finish portions for said containers, means adjacent to said initial forming means for immediately and fully forming from said gobs the remaining portions of said containers, means for transferring the fully formed containers in spaced relationship from each other, said transferring means provided with gripping means for holding only the initially formed portions of the containers, means proximate to said gripping means for receiving said containers, said receiving means including cradle means for engaging only the finish of said containers, means for annealing said containers while engaged in said cradle means whereby said containers are subjected to a controlled rate of cooling, and means associated with said annealing means for rapidly cooling the containers.

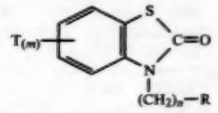
4,371,388

3-SUBSTITUTED AMINOALKYL-2-BENZOTHIAZOLINONES AS PLANT GROWTH REGULANTS

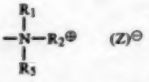
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 25, 1980, Ser. No. 115,475
Int. Cl.³ A01N *43/78*; C07D *277/68*
U.S. Cl. 71—90 **10 Claims**

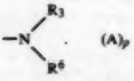
6. A method of regulating the natural growth and development of leguminous plants which comprises applying to said leguminous plants or their habitat an effective plant growth regulating amount of a compound of the formula



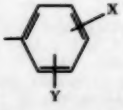
wherein T is halogen, m is an integer of from 0 to 2, n is an integer of from 1 to 3, and R is a



group or a



group wherein Z is halogen, p is an integer 0 or 1, A is a strong acid having a pKa in water of 2.5 or less, R_1 and R_2 are independently lower alkyl, R_3 is hydrogen or lower alkyl, R_5 is independently selected from the group consisting of lower alkyl, phenyl, a halopyridinyl group and a



group wherein X is selected from the group consisting of hydrogen, halogen, lower alkyl and trifluoromethyl and Y is lower alkyl or trifluoromethyl, R_6 is hydrogen or a group represented by R_4 and R_1 and R_5 together with the nitrogen or

R_3 and R_6 together with the nitrogen can form a cyclic ring selected from the group consisting of piperidyl, morpholino and N'-lower alkyl-piperazinyl.

4,371,389

2-CHLORO-4,5-DISUBSTITUTED-THIAZOLES USEFUL AS HERBICIDAL SAFENERS

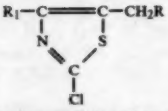
Robert K. Howe, Bridgeton, and Len F. Lee, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 80,751, Oct. 1, 1979, Pat. No. 4,284,426. This application Aug. 28, 1980, Ser. No. 182,255

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—90 **19 Claims**

1. A method of reducing herbicidal injury to sorghum plants due to application thereto of alachlor or butachlor herbicide which comprises applying to the plant locus a non-phytotoxic safening effective amount of a compound having the formula:



where R is equal to lower alkyl carbonyloxy, lower alkoxy carbonyl or lower alkoxy carbonyl (lower) alkoxy; R_1 is lower alkyl, halo (lower) alkyl, phenyl, or phenyl substituted by one to three groups, which may be the same or different, selected from the group consisting of halogen, lower alkyl, trifluoromethyl and cyano.

4,371,390

FLOWABLE HERBICIDES

Francis J. Le Clair, Webster Groves, and John M. Surgant, Clayton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 957,125, Nov. 3, 1978, abandoned. This application Nov. 26, 1980, Ser. No. 210,717

Int. Cl.³ A01N *25/02, 25/00*

U.S. Cl. 71—93 **6 Claims**

1. Flowable herbicide having the following composition by weight:

(a) from 25% to 50% of propachlor herbicide;

(b) from 0 to 15% of atrazine;

(c) an emulsifier/suspension system comprising

(i) hydrated amorphous silicon dioxide: 2–8%

(ii) polyoxypropylene/polyoxyethylene block copolymer mol. wt. about 6500: 2–8%

(iii) hydrated aluminum silicate: 0.5–2%

(d) an inert, low-freezing point polyglycol solvent compatible with components (c) (i)-(iii): 5–15%

(e) defoamer: 0–0.1%, and

(f) water: 30–70%

the solid components of said composition having a particle size no greater than about 20 microns.

4,371,391

HERBICIDAL SULFONAMIDES

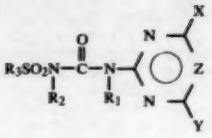
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 187,174, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 840,167, Oct. 6, 1977, Pat. No. 4,257,802. This application May 7, 1981, Ser. No. 257,585

Int. Cl.³ C07D *251/42, 251/46;* **A01N** *43/66*

U.S. Cl. 71—93 **30 Claims**

1. A compound of the formula:



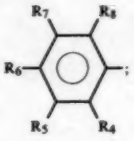
(I)

wherein

R_1 is H, alkyl of one to three carbon atoms or —OCH_3;

R_2 is H or alkyl of one to three carbon atoms;

R_3 is



R_7 is hydrogen, fluorine, chlorine, bromine, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, nitro, CF_3, CH_3S or CH_3CH_2S;

R_4 is $R_9S(O)_n$;

R_5, R_6 and R_8 are independently hydrogen, fluorine, chlorine, bromine, methyl or methoxy;

R_9 is C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopentyl or cyclopropylmethyl;

X is CH_3, —CH_2CH_3, alkoxy of one to three carbons, CF_3, CH_3S—, CH_3OCH_2— or $CH_3OCH_2CH_2O$—;

Y is CH_3 or OCH_3;

Z is N; and

n is 0, 1 or 2;

and their agriculturally suitable salts; provided that:

(a) R_1 and R_2 may not simultaneously be hydrogen;

(b) when R_6 is other than H, then R_5, R_7 and R_8 must be hydrogen;

(c) when n is 1, then R_7 is other than CH_3S or CH_3CH_2S, and X is other than CH_3S;

(d) when R_6 is H and R_5, R_7 and R_8 are other than H, then R_5, R_7 and R_8 must either be Cl or CH_3; and

(e) when R_9 is C_1–C_2 alkyl, then n is 1 or 2.

23. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,371,392

PROCESS FOR REFINING A MOLTEN METAL

Kazumasa Hasegawa; Minao Ito, both of Tokai; Saburo Sugiura, Nagoya; Kiyoichi Yamano, and Shizunori Hayakawa, both of Tokai, all of Japan, assignors to Daido Tokishuko Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 100,433, Dec. 5, 1979, Pat. No. 4,308,415. This application Jul. 20, 1981, Ser. No. 284,802

Claims priority, application Japan, Dec. 27, 1978, 53-160068; Jun. 11, 1979, 54-73352

Int. Cl.³ H05B *7/18;* **C22B** *4/00*

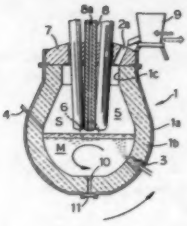
U.S. Cl. 75—10 R **14 Claims**

1. Method of refining molten metal under an inert atmosphere comprising:

charging flux and molten metal to be refined into a refining vessel provided with at least one heating electrode and a first inert gas blowing means having a nozzle exiting to the interior of said vessel above the molten metal level when the vessel is in the upright position but which nozzle is immersed in the molten metal only when the refining vessel is tilted by rotation, the refining vessel being also provided with a second inert gas blowing means from which inert gas is blown into the molten metal contained

in the refining vessel when the vessel is in the upright position prior to its being tilted;

effecting a first refining by heating said molten metal with said electrode, while maintaining the inside of said vessel under an inert atmosphere, thereby causing the molten metal to be reacted with said flux;



subsequently effecting a second refining by rotating said vessel to tilt same enough to immerse said blowing nozzle of said first inert gas blowing means in the molten metal and blowing inert gas from said nozzle into said molten metal; and

taking out the thus refined molten metal from said refining vessel.

4,371,393

ZERO VALENT METAL RECOVERY WITH POLYACETYLENE

Robert D. Gleim, Newtown, and Richard T. Gray, Levittown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 2, 1981, Ser. No. 269,290
Int. Cl.³ C22B *11/04, 5/00*
U.S. Cl. 75—108 **13 Claims**

1. A process for the production of a zero valent metal from an aqueous solution of a salt of said metal comprising contacting said metal salt solution, wherein said metal salt has a reduction potential of about +0.5 V or greater, with polyacetylene for a period of time sufficient to reduce at least a portion of said metal salt to a zero valent metal while leaving said polyacetylene in a substantially non-doped state.

4,371,394

CORROSION RESISTANT AUSTENITIC ALLOY

Michael Henthorne, Los Altos; Robert J. Yinger, Jamul, both of Calif., and Terry A. DeBold, Wyomissing, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Nov. 21, 1980, Ser. No. 209,056
Int. Cl.³ C22C *38/58*
U.S. Cl. 75—128 A **26 Claims**

1. A corrosion resistant austenitic stainless steel alloy consisting essentially in weight percent of about

	(w/o)
C	0.03–0.1
Mn	4–11
Si	0.6 Max.
Cr	20–23
Ni	14–18
Mo	5.05–5.6
B	0.01 Max.
Ce + La	0.4 Max.
Al	0.1 Max.
[C + N	0.23 Min.]

in which nitrogen ranges from a minimum of 0.15 w/o to no more than the amount that can be retained in solid solution, the minimum amount of carbon plus nitrogen being equal to:

$$.23 + \frac{(\%\ \text{Mo} - 4.8)}{10} + (\%\ \text{Mn} - 4) \times .03$$

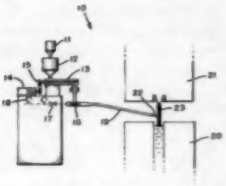
the balance being essentially iron, and the elements being balanced so that cold rolled annealed specimens prepared with a crevice and tested in accordance with ASTM G48-76 in 10 w/o $FeCl_3.6H_2O$ at 50 C. for 72 hours have a weight loss of less than 0.3 gram.

4,371,395

TECHNIQUE FOR ADDING LEAD TO STEEL

Robert H. Ogletree, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Jul. 6, 1981, Ser. No. 280,717
Int. Cl.³ C21B *7/02*
U.S. Cl. 75—129 **15 Claims**



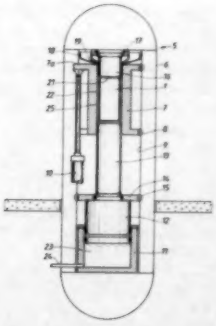
1. A method of producing leaded, resulfurized free machining steel comprising the steps of preparing a molten steel melt, deoxidizing said steel melt with from about 0.3 to about 1.65 percent by weight of manganese in the form of ferromanganese, introducing particulated lead sulfide into the molten steel, and cooling the molten steel to solidification in a mold.

4,371,396

METHOD FOR MANUFACTURING BILLETS, FROM METAL POWDER, INTENDED TO BE SUBSEQUENTLY ROLLED OR FORGED

Hans G. Larsson, and Erik Westman, both of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Feb. 22, 1980, Ser. No. 123,731
Claims priority, application Sweden, Feb. 27, 1979, 7901734
Int. Cl.³ B22F *3/14*
U.S. Cl. 419—56 **9 Claims**



1. A method for manufacturing metallic bodies intended to be subsequently machined into a desired shape by plastic deformation, comprising the steps of filling a sheath capsule with metal powder grains, sealing the capsule closed, heating the

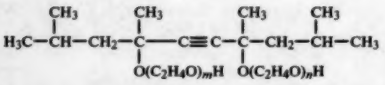
filled and sealed capsule at a heating station to a predetermined metal powder bonding temperature, and subjecting the filled and sealed capsule at the bonding temperature to a predetermined high pressure at a pressing station in the absence of external heat until the powder grains are bonded together to form a substantially solid body, the subjecting step comprising the steps of placing one end of the capsule at the bonding temperature on a layer of deformable and heat-insulating material in an over-sized forming cavity of a press which includes at least one movable punch, said material comprising unheated talc or pyrophyllite, an annular space being defined between said press and the capsule after insertion, filling said space with said deformable material in powder or grain form with the capsule in said press, and covering a layer of said material over the opposite end of the capsule so as to completely surround the capsule, whereby said deformable material completely fills said space and influences the capsule isostatically during the subjecting step to thereby effect the application of pressure completely against all sides of the capsule such that any folding or corrugating of the capsule sheath is substantially avoided, and whereby said deformable material has the necessary heat-insulating characteristic such that equalization of the temperature within the capsule is brought about by delaying the compressing thereof until the surface layer, which may have cooled between said heating and subjecting steps, has been re-heated by heat transfer from the inner portion of the capsule.

4,371,397
CHEMICAL COPPER-PLATING BATH

Hideo Honma, Yokohama; Kunihiro Ikari, Yokosuka; Osamu Sasaki, Sagamihara; Toshiki Sasabe, Tokyo; Kazuhiro Takeda, and Tsutomu Takamura, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 4, 1980, Ser. No. 212,998
Claims priority, application Japan, May 8, 1980, 55-59962
Int. Cl.³ C23C *3/02*
U.S. Cl. 106—1.23 **6 Claims**

1. In a chemical copper-plating bath, comprising a copper salt, a complex-forming agent, a reducing agent and a pH controller, the improvement which comprises a nonionic surfactant represented by the formula:



wherein m and n are integers of 1 or more, and $m+n \geqq 12$, and at least one compound selected from the group consisting of 2,9-dimethyl-1,10-phenanthroline and 2,2'-dipyridyl in amounts effective to improve the ductility of copper films produced from the bath.

4,371,398
POLISHES/POLISH RESTORERS

Americo L. Forchielli, Sterling Junction, Mass., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 16, 1980, Ser. No. 169,340
Int. Cl.³ C09G *1/04, 1/16*
U.S. Cl. 106—10 **19 Claims**

1. A composition of matter useful as a protective coating and coating restorer comprising: (1) a liquid water-insoluble polyolefin formed by polymerizing alpha-olefins of the formula $RCH{=}CH_2$ where R is a hydrocarbon group, (2) an emulsifier for said polyolefin, (3) a solvent which can also be a leveling agent, and (4) water.

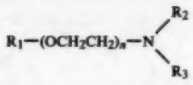
4,371,399
WATER-REPELLENT GYPSUM MORTAR

Adolf May, Hofheim am Taunus; Franz J. Voetz, Camberg, and August Gerl, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,313
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105407
Int. Cl.³ C04B *11/00*
U.S. Cl. 106—109 **3 Claims**

1. A water-repellent gypsum mortar, which contains an agent conferring hydrophobic properties, which is composed of

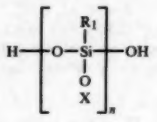
(a) a fatty amine of the formula



in which R_1 is C_8–C_{22}-alkyl, preferably C_{14}–C_{22}-alkyl, C_8–C_{22}-alkenyl, preferably C_{14}–C_{22}-alkenyl, or C_8–C_{22}-alkylphenyl, R_2 and R_3 are hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, C_1–C_4-hydroxyalkyl, phenyl, benzyl or a group of the formula $-(CH_2CH_2O)_nH$ and n is a number from 0 to 4,

(b) a low-molecular acid and

(c) an alkali metal siliconate of the formula

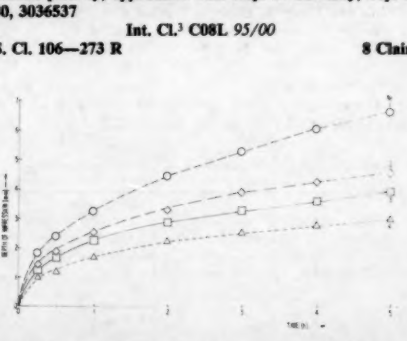


in which R_1 is C_1–C_7-alkyl, C_1–C_7-alkenyl, phenyl or benzyl, X is an alkali metal ion and n is a number from 1 to 10.

4,371,400
MASTIC ASPHALT COMPOSITION

Karl-Hans Müller, Bruchköbel, and Walter Barthel, Langenselbold, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 20, 1981, Ser. No. 294,657
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1980, 3036537
Int. Cl.³ C08L *95/00*
U.S. Cl. 106—273 R **8 Claims**



1. A mastic asphalt composition comprising mastic asphalt and 0.2 to 5 wt. % of at least one crystalline, powdered, synthetic zeolite based on the total mixture.

4,371,401

BITUMINOUS MIXTURES FOR ROADS WITH VERY HIGH PERFORMANCES, METHOD FOR PRODUCING SAID MIXTURES AND THEIR APPLICATION ON ROADS

Georges Langumier, Saint Germain en Laye, France, assignor to Travaux et Produits Routiers, Paris, France

Filed Jun. 3, 1981, Ser. No. 269,978
Claims priority, application France, Jun. 5, 1980, 80 12554
Int. Cl.³ C08L 95/00
U.S. Cl. 106—281 R **9 Claims**

1. High performance bituminous mixtures for roads having resistance to rutting and to cracking, wherein the said mixtures consist in a granular composition basically containing hard rock aggregate and a binder composed of very hard bitumens used in an amount corresponding to a corrected richness modulus K ranging from 3.8 to 4.5 in accordance with the relation:

$$\text{binder content} = K\sqrt[5]{\Sigma \cdot \alpha}$$

where Σ=conventional specific surface-area of the aggregate=0.25 G+2.3 S+12 s+135 f, in square meters per kilogran (m^2/kg) with the proportions by weight:

G representing the percentage of particles larger than 6 mm,

S representing the percentage of particles ranging from 6 to 0.315 mm,

s representing the percentage of particles ranging from 0.315 to 0.08 mm,

f representing the percentage of particles smaller than 0.08 mm,

K=corrected richness modulus,

α=corrective coefficient intended to take into account the mass per unit volume of the aggregate,

said binder having a ball and ring temperature of 70° to 90° C., a penetrability at 25° C. of 5 to 20, a PFEIFFER penetration index >1, and an embedding temperature of 175° C.

4,371,402

PROCESS FOR PREPARATION OF FRUCTOSE-CONTAINING SOLID SUGAR

Hiroshi Kubota, Tokyo, Japan, assignor to Kawazu Sangyo Kabushiki Kaisha, Japan

Filed Aug. 5, 1981, Ser. No. 290,198
Claims priority, application Japan, Aug. 11, 1980, 55-109264
Int. Cl.³ C13F 1/02, 1/04; C13K 11/00
U.S. Cl. 127—60 **15 Claims**

1. A process for preparation of fructose containing solid sugar, said process comprising:

a step of dehydration in which fructose containing liquid sugar of FE of less than 100 is brought, while in the presence of an organic solvent exhibiting azeotropic behaviour with respect to water, in contact with a stream of gas causing no denaturation of fructose containing sugar, with heating during the dehydration step to remove water in a vapor phase together with said organic solvent thereby to reduce the water content to less than 3% by weight with respect to said fructose-containing sugar (excluding the residual organic solvent);

a step of aging in which the fructose containing liquid sugar obtained from said step of dehydration is subjected to seed crystal addition treatment in 1 to 20% by weight of organic solvent and the aging is carried out until an aged, somewhat deliquescent crystalline aggregate is formed from the sugar;

a step of solidification in which the aged fructose containing sugar obtained from said step of aging is introduced into anhydrous alcohol and kept therein until any molasses mixed in the sugar is eluted and the sugar is solidified as a non-deliquescent sugar; and

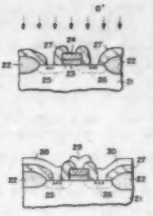
a step of removing the alcohol from the solid non-deliquescent sugar obtained from said step of solidification.

4,371,403

METHOD OF PROVIDING GETTERING SITES THROUGH ELECTRODE WINDOWS

Hiroyuki Ikubo, and Kunihiko Wada, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1980, Ser. No. 217,756
Claims priority, application Japan, Dec. 20, 1979, 54-166211
Int. Cl.³ H01L 21/265
U.S. Cl. 148—1.5 **5 Claims**



1. A method of manufacturing a semiconductor device employing a semiconductor substrate having a main surface comprising the steps of:

ion implanting an impurity material into a predetermined surface area of the main surface of said semiconductor substrate to form at least one desired region of a predetermined conductivity type extending into said substrate from said main surface thereof and forming a pn junction with said substrate material,

forming an insulating layer on the entire said selected main surface of said semiconductor substrate,

opening a window in said insulating layer aligned with each respective said at least one desired region and having a smaller area than said predetermined surface area of said respective desired region for an electrical contact to said desired region within said smaller area,

implanting ions of a gettering material having the effect of gettering defects through said window and into the surface of said desired region, localized therein by said smaller area of said window and to a controlled depth so as not to reach said pn junction of said region with said substrate, said gettering material being selected from the class consisting of oxygen, carbon, fluorine and argon, and

providing a conductive layer on said substrate main surface including said insulating layer thereon, and forming an electrode for electrically contacting each said desired region within said respective window.

4,371,404

SINGLE CRYSTAL NICKEL SUPERALLOY

David N. Duhl, Newington, and Xuan Nguyen-Dinh, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 23, 1980, Ser. No. 114,763
Int. Cl.³ C22F 1/10
U.S. Cl. 148—3 **2 Claims**

2. A method for producing a single crystal superalloy article, suited for use as an element in a gas turbine engine, which consists of:

a. providing a composition consisting essentially of 6.5 to 8.2% Cr, 4.5 to 5.5% Al, 0.7 to 1.5% Ti, 1.7 to 2.3% Mo, 3 to 5% W, 10.0 to 13.5% Ta, up to 3% Re, 3 to 8% Co, balance essentially nickel;

b. melting and directionally solidifying the composition to produce a single crystal article;

c. heat treating the article between about 2385° and 2390° F. for from about 1 to 10 hours;
d. cooling the article;
e. reheating the article to at least one temperature between about 1500° and 2100° F. and holding the article within the temperature range of 1500° to 2100° F. for from about 2 to 50 hours.

4,371,405
PROCESS FOR PRODUCING GRAIN-ORIENTED SILICON STEEL STRIP

Jiro Harase; Kunihide Takashima, both of Munakatamachi, and Shozaburo Nakashima, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,633
Claims priority, application Japan, Aug. 22, 1979, 54-106797
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—111 **8 Claims**

1. A process for producing a grain-oriented silicon steel strip or sheet with a high magnetic flux density said process employing AlN as a grain-growth inhibitor to achieve secondary recrystallization, said process comprising the steps of:
forming a silicon steel slab containing from 0.030 to 0.085% by weight of carbon, from 2.5 to 4% by weight of silicon, from 0.010 to 0.065% by weight of an acid-soluble aluminum, from 0.0030 to 0.012% by weight of nitrogen, from 0.05 to 0.20% by weight of manganese, and from 0.005 to 0.040% by weight of sulfur, the balance being iron and unavoidable impurities;
hot rolling the silicon steel slab and coiling the resulting hot rolled strip at a temperature controlled within a range of from 700° to 1000° C.;
heavily cold rolling the hot rolled strip in one step to reduce the thickness of the strip an amount of not less than 80% so that it reaches the final gauge;
decarburization-annealing the strip, and coating the strip with a separating agent, and finally, finish-annealing the strip.

4,371,406
SOLID-STATE DEVICE

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation of Ser. No. 764,433, Jan. 31, 1977, Pat. No. 4,136,435, which is a continuation of Ser. No. 405,138, Oct. 10, 1973, abandoned, and Ser. No. 580,414, May 23, 1975, abandoned, said Ser. No. 405,138, and Ser. No. 580,415, each is a continuation-in-part of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, and a continuation-in-part of Ser. No. 386,102, Aug. 6, 1973, and a continuation-in-part of Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned, said Ser. No. 802,018, is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109. This application Jan. 29, 1979, Ser. No. 7,584
The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—171 **26 Claims**

1. A method of making an active solid-state device comprising:
forming by a process which includes directional melt growth a structure having first phase bodies which are substantially parallel to each other and are spaced from each other by second phase bodies, each of the bodies of at least one of the phases being a single crystal semiconductor substance, the first phase bodies physically contacting the second phase bodies, and the structure including PN junctions which are within the semiconductor material bodies and said structure being crystallographically discontinuous at said physical contact between the first and second phase bodies, and
providing electrical contact to the bodies of at least one of said phases to enable the structure to operate as an active device.

4,371,407
METHOD FOR PRODUCING SEMICONDUCTOR DEVICE

Kei Kurosawa, Toyko, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 28, 1981, Ser. No. 315,909
Claims priority, application Japan, Oct. 28, 1980, 55-150992; Apr. 17, 1981, 56-57899
Int. Cl.³ H01L *7/44;* **C23C** *15/00*
U.S. Cl. 148—187 **9 Claims**

1. A method for producing a semiconductor device comprising the steps of:
forming a first material film on a semiconductor substrate;
forming a second material film on said first material film;
selectively removing said second material film;
exposing a structure thus formed to a gas plasma atmosphere to form a plasma polymerization film on at least an exposed surface of said first material film;
removing a remainder of said second material film; and
removing the exposed surface of said first material film by using said plasma polymerization film as a mask to form a first material film pattern.

4,371,408
LOW WATER EMULSION EXPLOSIVE COMPOSITIONS OPTIONALLY CONTAINING INERT SALTS

Harold T. Fillman, Bowie, Md., assignor to Atlas Powder Company, Dallas, Tex.

Filed Oct. 27, 1980, Ser. No. 201,208
Int. Cl.³ C06B *45/02*
U.S. Cl. 149—21 **26 Claims**

1. A water-in-oil explosive emulsion composition having a ½ cartridge gap sensitivity of at least about three inches formed from an emulsion matrix having:
from about 4% to less than about 10% by weight water, and comprising from about 4% to about 10% by weight of the total explosive emulsion composition of a lower alkylamine, nitrate or alkanolamine nitrate sensitizing agent and from about 0.25 to less than about 1% by weight of the total explosive emulsion composition nonexplosive detonation catalyst.

4,371,409
GELATINIZED HIGH EXPLOSIVE COMPOSITION AND METHOD OF PREPARATION

Richard V. Cartwright, Sussex, N.J., and Ronald D. Lees, Bartlesville, Okla., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jun. 1, 1981, Ser. No. 268,559
Int. Cl.³ C06B *25/28*
U.S. Cl. 149—94 **7 Claims**

1. A high explosive composition comprising:
an explosive sensitizer composition consisting essentially of an amount within the range of about 5% to 95% of a liquid nitrated polyol derived from an aliphatic polyol having from 2 to about 6 alcoholic hydroxyl groups and from 2 to about 10 carbon atoms and an amount with the range from about 95% to about 5% of metriol trinitrate, said sensitizer composition gelatinized by nitrocellulose and a polar compatibility additive taken from the group consisting of

dimethylformamide, formamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone and dimethylsulfoxide.

4,371,410

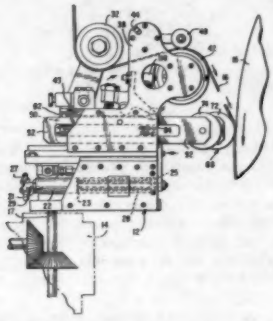
METHOD FOR APPLYING, STITCHING AND SEVERING A TAPE ON A BODY

Samuel B. Stevens, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 133,634, Sep. 11, 1979, Pat. No. 4,295,916. This application Jul. 6, 1981, Ser. No. 280,195

Int. Cl.³ B29H *17/00*

U.S. Cl. 156—117 **6 Claims**



1. A method of applying and stitching a tape (16) onto a body (15) comprising the steps of supplying a tape (16) to an applicator roller (42) in contact with the moving body (15), stitching said tape (16) to said body (15) by passing stitching rollers (72) over said tape (16) in contact with said body (15), stopping rotation of the body (15) upon completion of the buildup of the layer of tape (16) on the body (15), retracting the applicator roller (42) from the body (15) while substantially simultaneously, applying a brake (94) to the applicator roller (42) to stop advancing said tape (16) to the body (15), moving said body (15) that is still in contact with the stitching rollers (72) to stretch the tape (16) between the braked applicator roller (42) and the stitching rollers (72) until said tape breaks somewhere between said applicator roller and said stitching rollers.

4,371,411

METHOD OF ADHERING UNVULCANIZED RUBBER TO VULCANIZED RUBBER THROUGH VULCANIZATION

Toshio Honda, Akigawa; Yukio Fukuura, Kodaira; Hikaru Ishikawa, Kokubunji; Shozo Kojima, Higashimurayama; Itsuo Tanuma, Tokorozawa, and Masao Ogawa, Kawagoe, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

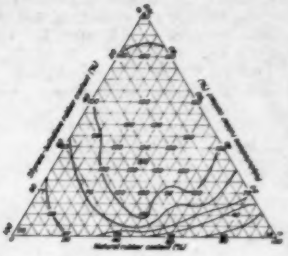
Continuation of Ser. No. 43,961, May 30, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 188,784

Claims priority, application Japan, May 30, 1978, 53-63769

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—281 **10 Claims**

1. A method of adhering an unvulcanized rubber sheet to a vulcanized rubber article through vulcanization, comprising disposing an unvulcanized rubber sheet, whose rubber component consists essentially of 30–70% by weight polybutadiene rubber, 10–40% by weight of styrene-butadiene rubber and 10–50% by weight of at least one of natural rubber and polyisoprene rubber, on the surface of a vulcanized rubber article containing at least 80% by weight, based on the amount of its rubber component, of at least one rubber selected from natural rubber, polybutadiene rubber and styrene-butadiene rubber, and then vulcanizing the unvulcanized rubber sheet, wherein treatment of said vulcanized rubber article prior to said vulcanizing consists of wiping off stains on the surface of said vulcanized article.



4,371,412

DRY ETCHING APPARATUS

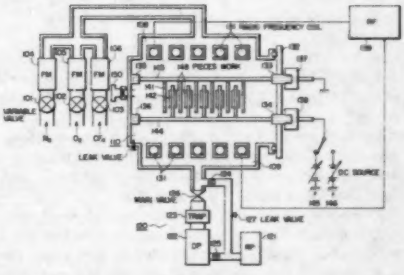
Junichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Division of Ser. No. 924,066, Jul. 12, 1978, Pat. No. 4,233,109, which is a continuation-in-part of Ser. No. 759,120, Jan. 13, 1977, abandoned. This application Jul. 3, 1980, Ser. No. 166,700

Claims priority, application Japan, Jan. 16, 1976, 51-4469; Aug. 27, 1976, 51-102825; Aug. 27, 1976, 51-102826

Int. Cl.³ C23F *1/02*; H01L *21/312*

U.S. Cl. 156—345 **8 Claims**



1. A dry etching apparatus comprising:

a hermetic processing chamber formed with a material inactive on a plasma gas;

a pair of electrode groups for applying a DC voltage therebetween, each group including a plurality of electrode plates, the electrode plates of respective groups being disposed alternately to form a plurality of parallel electrodes;

two supporting rods for supporting said respective groups of electrode plates, at least one of said rods being slidable along and rotatable about its axis;

a DC electric source connected between said pair of electrode groups for applying a DC voltage therebetween;

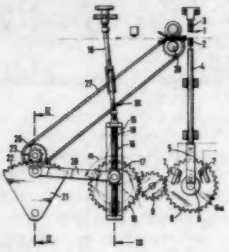
a RF coil and a RF power source for exciting a plasma gas;

a plurality of gas inlets formed through said hermetic processing chamber along the axis of said supporting rod for introducing a gas for generating a plasma gas substantially parallel with said electrode plates.

4,371,413
APPARATUS FOR APPLYING TRANSVERSE WELD OR WELD-SEVERING SEAMS TO A WEB OF THERMOPLASTIC OR HOT-SEALABLE MATERIAL

Friedhelm Mundus, Lengerich of Westphalia, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,166
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3026038
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—349 2 Claims



1. Device for application of transverse weld or weld-severing seams to a web of material comprising:

a pair of welding jaws, one of which is reciprocatable;

crank drive means for reciprocating said one jaw and having a rotatable shaft, rod means moved by said crank shaft for moving said one jaw, and a cam plate secured to said crank shaft;

contact means actuatable by said cam plate during rotation of said crank shaft for producing control signals;

a gear (10) carrying a crank pin;

first drive means for interconnecting said crank shaft and said gear (10) so that said gear (10) is rotatably driven by said crank shaft and rotates at the same speed as said crank shaft;

a swing arm having a longitudinally-extending slot formed therein receiving said crank pin so that said crank pin is longitudinally displaceable therein and said swing arm is oscillated by rotation of said gear (10);

a shaft supporting said swing arm for pivotal movement;

a coupling rod having one end connected to said swing arm so that said coupling rod is movable by said swing arm;

a gear wheel segment connected to a second end of said coupling rod so that the gear wheel segment is oscillated by said swing arm;

feed roller means having a driving movement for feeding the web with respect to the welding jaws;

second drive means for interconnecting said gear wheel segment and said feed roller means so that said gear wheel segment rotates said feed roller means thereby providing said driving movement;

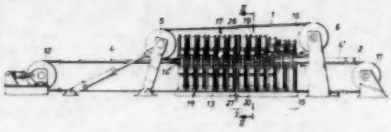
clutch-brake unit means responsive to said control signals for controlling driving movement of said feed roller means, said clutch-brake unit means being movable between a coupling position in which said feed roller means are driven by said gear wheel segment and an uncoupling position in which the feed roller means are uncoupled from said gear wheel segment,

said gear (10) being positioned with respect to said shaft of said swing arm such that driving movement of said feed rollers occurs during rotation of said gear (10) through a sector facing away from said shaft.

4,371,414
CONTROL SYSTEM FOR A CONTINUOUSLY OPERATING PRESS

Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 912,983, Jun. 6, 1978, abandoned. This application Dec. 18, 1981, Ser. No. 332,182
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725640
Int. Cl.³ B30B *5/06*
U.S. Cl. 156—361 3 Claims



1. In a control system for a continuously operating press, for the manufacture of chipboard, molded laminated plastic and the like, having two endless revolving forming belts which advance opposite each other in a pressing section, between which a starting material is compressed in the pressing section and each of which belts is provided with a separate drive, one of the drives being a lead drive equipped with a speed control for holding the belt velocity constant, the improvement comprising:

(a) a torque controller for comparing the torque of the lead drive with the torque of the other drive and providing an output which regulates the torque of the other drive such that the torques of the two drives always retain an adjustable ratio between each other over the entire torque range; and

(b) a further speed control for the belt drive which is not operating as the lead drive which is set higher than the speed control of the lead drive and which is adapted to be adjusted along with the speed control of the lead drive, with the speed ratio remaining the same.

4,371,415
PROCESS FOR MANUFACTURING SYNTHETIC RESIN HOSE HAVING A REINFORCING MEMBER EMBEDDED THEREIN AND APPARATUS THEREOF

Kenichi Tanaka, Musashino, Japan, assignor to Kakuichi Co. Ltd., Nagano, Japan

Continuation of Ser. No. 188,702, Sep. 19, 1980, Pat. No. 4,326,905, which is a continuation of Ser. No. 968,753, Dec. 13, 1978, abandoned, which is a division of Ser. No. 902,825, May 4, 1978, Pat. No. 4,194,942. This application May 22, 1981, Ser. No. 266,334
Claims priority, application Japan, Oct. 15, 1977, 52-122967
The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.
Int. Cl.³ B29D *23/05*; B32B *31/00*
U.S. Cl. 156—433 6 Claims

1. An apparatus for manufacturing a synthetic resin hose having a tubular reinforcing member embedded therein, comprising:

a plurality of bobbin creels for guiding warp material;

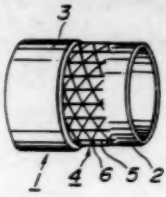
warp treating means for applying a bonding agent to said warp materials by means of a guide roller in a bonding agent tub;

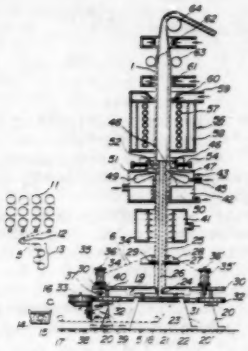
a hollow cylindrical member having diameter adjusting discs provided with yarn guide holes for guiding a plurality of binding agent bearing warps to the outer peripheral surface of a hollow cylindrical member;

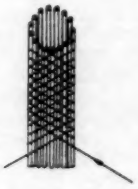
means for guiding warps through said yarn guide holes to the outer peripheral surface of a hollow cylindrical member for forming a tubular member of warps lying parallel to each other parallel to the axis of the tubular member;

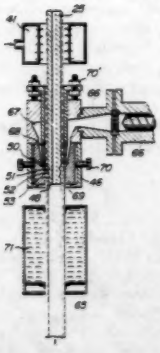
a braiding machine surrounding said hollow cylindrical

member for weaving braiding yarns into a braided member on the outer periphery of said tubular warp member formed by a plurality of warps guided to the outer periph-









eral surface of the hollow cylindrical member and mutually aligned in parallel relation in the tubular member;

means for weaving a plurality of braiding yarns into a braid member consecutively in overlying relation around the outer peripheral surface of said warp tubular member thereby preparing a tubular reinforcing member;

a first heating unit surrounding said hollow cylindrical member for bonding the tubular warp member to the braided member at the contacts therebetween for heat-setting a tubular reinforcing member consisting of the warp tubular member and the braided member;

a first cooling unit provided adjacent said first heating unit for solidifying said tubular reinforcing member;

a resin applying unit having a manifold and die for coating synthetic resin onto the inner and outer peripheral surface of said tubular reinforcing member;

a second heating unit for gelation of synthetic resin coated to said tubular reinforcing member;

a second cooling unit for air-cooling the composite tubular synthetic resin hose with embedded tubular reinforcing member; and

means for taking up said synthetic resin hose to a winding-up reel under a constant tension;

wherein said hollow cylindrical member has a tapered portion surrounded by the first heating unit for ensuring the smooth upward movement of said tubular reinforcing member along the outer peripheral surface of the hollow cylindrical member, the degree of taper being relating to the thermal shrinkage percentage of the braiding yarns used; and

said member, said machine, said means and said units are arranged in the order described successively from one end of the hollow cylindrical member to said winding-up reel.

4,371,416

SUBASSEMBLY COMBINATION FOR MAIL PROCESSING MACHINES

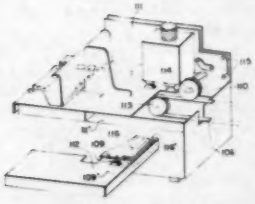
Horst Deuzin, Berlin, Fed. Rep. of Germany, assignor to Francotyp GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,431

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948928

Int. Cl.³ B29H 9/00

U.S. Cl. 156—441.5 **3 Claims**



1. Subassembly combination for mail processing machines, comprising a letter feeding machine, and a moistening device having a rotatable drum for moving mail-wetting liquid and a sealing device being mountable on said letter feeding machine, said letter feeding machine having a transport cylinder for transporting mail, a common drive gear for said letter feeding machine, moistening device and sealing device, and a common shaft on which said transport cylinder and drive gear are mounted, a serrated belt disposed on said common drive gear for selectively driving said sealing device and said rotating drum said sealing device including a transport wheel for transporting mail, a mail sealing cylinder, two gears being rotatable by said serrated belt, a first shaft on which said transport wheel and one of said two gears is mounted, and a second shaft on which said sealing cylinder and another of said two gears is mounted, said moistening and sealing devices being attachable

to and detachable from said letter feeding machine independently of the operation of said letter feeding machine.

4,371,417

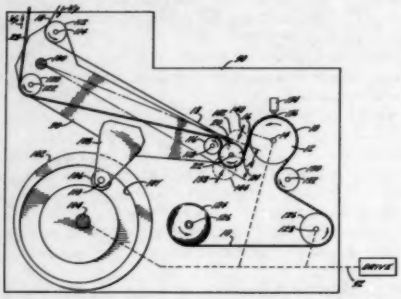
DIFFERENTIALLY STRETCHED ELASTIC

Richard H. Frick, Neenah; Randolph J. Hill, Appleton, and David R. Roland, Winneconne, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 1, 1981, Ser. No. 307,423

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—495 **9 Claims**



1. In an apparatus for attaching elastic strips in elastic leg disposable diapers having elasticized leg openings during the manufacture of such diapers moving in serially-interconnected form in an assembly machine and including means for feeding continuous elastic strips into desired positions in the diaper for adhesive attachment continuously along the longitudinal edges of the diapers and means for alternately stretching and relaxing predetermined lengths of the elastic strips during the feeding thereof for attaching the stretched lengths to the crotch area and substantially relaxed lengths to the outer waist areas; the improvement of said means for alternately stretching and relaxing predetermined lengths of the continuous elastic strips comprising:

(a) a movable guiding means for guiding the flow of the serially-interconnected diaper material along a predefined but movable path, and

(b) periodic driving means connected to the movable guiding means for periodically displacing the predefined path of the serially-interconnected diaper material with respect to the means for feeding the continuous elastic strips,

thereby alternately relaxing and stretching the elastic fed to and bonded to the diaper material.

4,371,418

FEEDING WEB MATERIAL

Wladyslaw H. Krywiczanin, Fairoak, and William Lumsden, Winchester, both of England, assignors to British-American Tobacco Company Limited, London, England

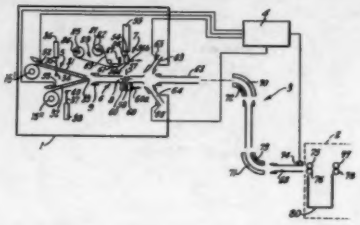
Filed Dec. 8, 1981, Ser. No. 328,674

Claims priority, application United Kingdom, Dec. 22, 1980, 8041062

Int. Cl.³ B31F *5/06*; B65H *19/18*

U.S. Cl. 156—497 **5 Claims**

1. Web-splicing apparatus comprising a web splicer and, associated therewith, an air mover and web-presentation means operable to present to the inlet end of the air mover the leading end of a first web extending from a reel and the leading end of a second web extending from another reel, which air mover is operable to feed the leading end of said first web from said presentation means to and in a path through a splicing zone of the said splicer, to serve as a guide for subsequent continuous passage of that web, and further operable to feed the leading end of the second said web from said presentation



means to said splicing zone during continuous passage of the first web through the air mover.

4,371,419

METHOD FOR PRODUCING A LITHIUM TANTALATE SINGLE CRYSTAL

Tsuguo Fukuda, Yokohama, and Hitoshi Hirano, Kanagawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

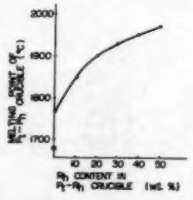
Continuation of Ser. No. 892,897, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 776,204, Mar. 10, 1977, Pat. No. 4,144,117. This application Jan. 25, 1980, Ser. No. 115,195

Claims priority, application Japan, Mar. 17, 1976, 51-28173

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.³ C30B *15/10*

U.S. Cl. 156—617 SP **11 Claims**



1. A method for producing a lithium tantalate single crystal comprising:

establishing a melt consisting essentially of lithium tantalate in a platinum-rhodium crucible consisting essentially of between 80% by weight and 65% platinum and between 20% and 35% rhodium,

contacting a seed crystal of lithium tantalate with said melt, and

pulling the seed crystal away from the melt to grow a lithium tantalate single crystal.

4,371,420

METHOD FOR CONTROLLING IMPURITIES IN LIQUID PHASE EPITAXIAL GROWTH

David A. Stevenson, Los Altos Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

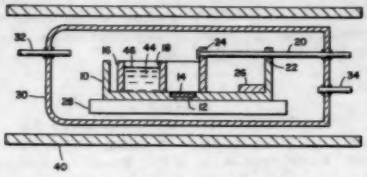
Filed Mar. 9, 1981, Ser. No. 241,997

Int. Cl.³ C30B *9/04*

U.S. Cl. 156—624 **12 Claims**

1. In a process for growth of a layer of undoped semiconductor material by precipitation from a solution of the semiconductor material in a solvent by liquid phase epitaxial growth,

the improvement comprising the step of adding from approximately 0.01% to 1.0% by weight of a material which forms an

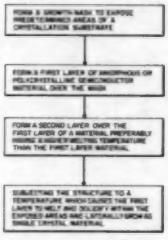


oxide and is soluble in the solvent to the solution prior to the step of precipitating said layer of semiconductor material.

4,371,421
LATERAL EPITAXIAL GROWTH BY SEEDED SOLIDIFICATION

John C. C. Fan, Chestnut Hill; Michael W. Geis, Acton, and Bor-Yeu Tsaur, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 16, 1981, Ser. No. 254,871
Int. Cl.³ C30B *19/00*
U.S. Cl. 156—624 **16 Claims**



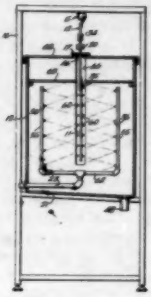
1. A method of forming a semiconductor body comprising:
a. forming a first layer of amorphous or polycrystalline material over a substrate;
b. disposing a single crystalline seed material adjacent a surface of said first layer;
c. forming a second layer over a substantial portion of said first layer;
d. heating said first layer to melt the first layer;
e. solidifying the first layer to transform the first layer material to large grain substantially single crystal material, the crystallinity of said first layer being influenced by the seed material.

4,371,422
CONTINUOUS PROCESSING OF PRINTED CIRCUIT BOARDS

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Oct. 15, 1980, Ser. No. 197,073
Int. Cl.³ H01L *21/306*; C23F *1/02*
U.S. Cl. 156—640 **7 Claims**

1. The method for continuous processing of printed circuit boards suspended by a hanger to remove the photoresist and final etch the copper cladding therefrom comprising the steps of,
conveyorizing the printed circuit board suspended from a hanger for continuous horizontal transport while each such printed circuit board is in a vertical plane,
providing a plurality of chambers each having slotted end members for passing the printed circuit boards as they are horizontally conveyed by the conveyorizing of the workpieces,
the chambers being provided with interior spray means for directing an operative fluid against the printed circuit boards,
each chamber having a substantially imperforate cover which is slotted,
positioning each hanger on a conveyor which is above the shielded slots and external to the chamber,
shielding the slots by substantially imperforate means for shielding the slots which are carried by the printed circuit

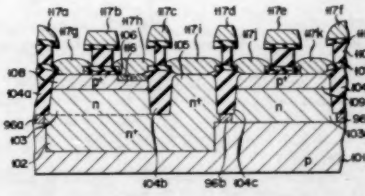


board hangers closely adjacent the slotted covers for each chamber,
activating one chamber with a photoresist remover,
activating another sequential chamber with a rinse for such printed circuit boards,
activating a further chamber with an etch for the cladding remaining on the printed circuit boards,
activating a further chamber to rinse the eteched boards,
whereby the photoresist and copper cladding are removed from the printed circuit boards while the same are continuously transported horizontally but remaining in a vertical plane in an environmentally shielded series of chambers.

4,371,423
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING A LIFT-OFF TECHNIQUE

Rokuro Yoshizawa, Neuss, Fed. Rep. of Germany, and Satoshi Shinozaki, Yokohama, Japan, assignors to VLSI Technology Research Association, Japan

Filed Sep. 3, 1980, Ser. No. 183,813
Claims priority, application Japan, Sep. 4, 1979, 54-113231; Sep. 4, 1979, 54-113232
Int. Cl.³ H01L *21/283, 21/308*
U.S. Cl. 156—653 **16 Claims**



1. A method of manufacturing a semiconductor device, comprising:
forming a first film on one principal surface of a semiconductor substrate having a plurality of semiconductor regions formed therein, said regions being isolated by separation walls;

forming a second film covering said first film, said second film having an etching characteristic different from that of said first film;

forming a first deposition layer on said second film, said first deposition layer having a higher etching speed than that of said second film when etched with a selected etchant;

forming a second deposition layer on said first deposition layer, said second deposition layer having a lower etching speed than that of said first deposition layer when etched with said selected etchant;

selectively etching preselected portions of said second and first deposition layers and said second film in succession, thereby exposing segments of said first film, said preselected portions corresponding to desired wiring patterns for said plurality of semiconductor regions of the device;

selectively side etching additional portions of said first deposition layer by etching said additional portions with said selected etchant at a higher etching speed than that of said second film and said second deposition layer;

etching the exposed segments of said first film with said selected etchant to form contact holes corresponding to said plurality of semiconductor regions, the etching of said exposed segments being performed simultaneously with said side etching of said first deposition layer;

then depositing a wiring metal on said contact holes from above said second deposition layer, the unetched portions of said second deposition layer comprising a deposition mask upon which portions of the wiring metal are deposited; and

then removing the remaining portions of said first deposition layer by etching, thereby lifting off the remaining portions of said second deposition layer and the portions of the wiring metal deposited thereon.

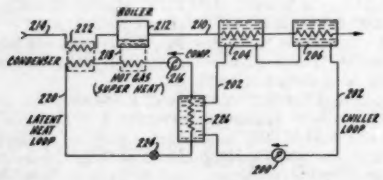
4,371,424
LATENT HEAT RECIRCULATING SYSTEM

Myron L. Anthony, Grand Junction, Colo., assignor to Sax Zzyxx, Ltd., Clifton, Colo.

Division of Ser. No. 169,441, Jul. 16, 1980, Pat. No. 4,294,664. This application Jun. 22, 1981, Ser. No. 276,073

Int. Cl.³ B01D *3/14*

U.S. Cl. 202—159 **20 Claims**



1. Apparatus for conserving energy while processing a process material in a process stream to recover its latent heat for return to the process stream and comprising:

(1) means providing an open process stream having a first heat accepting means and a first heat rejecting means;

(2) means providing a closed refrigerator loop having second heat accepting means and second heat rejecting means;

(3) means providing a closed chiller loop having third heat accepting means and third heat rejecting means;

(4) means for indirectly exchanging heat between said second heat accepting means and said third heat rejecting means;

(5) means for indirectly exchanging heat between said first heat rejecting means and said third heat accepting means; and

(6) means for indirectly exchanging heat between said second heat rejecting means and said first heat accepting means,

thereby enabling said latent heat to be passed to the chiller loop and from there to the refrigerator loop for exchange back to the process stream, and allowing adjustments to be made in the refrigerator loop for efficiency and performance without necessarily effecting the chiller loop.

4,371,425
SHAFT-LIKE DRY COOLER FOR COKE

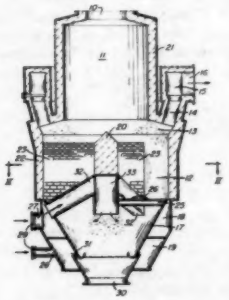
Wilhelm Danguillier, Bochum; Wolfgang Grams, Herne, and Jürgen Tietze, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,231

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018814

Int. Cl.³ C10B *39/02*

U.S. Cl. 202—228 **5 Claims**



1. A shaft-like cooler for dry cooling of coke with gases conveyed through the coke, said cooler having the combination of a top antechamber having a coke-charging opening in the top thereof, a cooling chamber below said top antechamber and including an inlet for cooling gases and a coke outlet at the bottom end thereof, said cooling chamber further including three generally vertical walls extending radially to divide said cooling chamber into three uniform shaft components, a central masonry core joining said radial walls together, a flow diverting prop disposed in each of said uniform shaft components, a masonry core centrally disposed in said cooling chamber on said vertical walls, said inlet for cooling gases including a pipe having a downwardly-directed discharge opening underneath said masonry core to form planes in descending coke for cooling gases to enter the coke, and a cylindrical wall including a gas outlet between said antechamber and said cooling chamber.

4,371,426
CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Robert J. DiBiano, and James W. Hobbs, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1981, Ser. No. 293,065

Int. Cl.³ B01D *3/42*

U.S. Cl. 203—2 **12 Claims**

7. A method for controlling a fractional distillation process in which heat is utilized to separate first and second components contained in a feed stream flowing to a fractional distillation column, wherein said first component is principally removed from said fractional distillation column as an overhead vapor stream, wherein said overhead vapor stream is at least partially condensed with a first portion of the condensate being returned to an upper portion of said fractional distillation column as an external reflux and a second portion of said

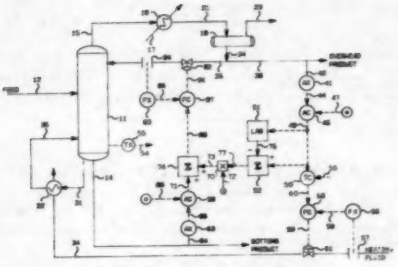
condensate being removed from said fractional distillation process as an overhead product, and wherein said second component is principally removed from said fractional distillation column as a bottoms product, said method comprising the steps of:

establishing a first signal representative of the concentration of said second component in said overhead product;

establishing a second signal representative of the desired concentration of said second component in said overhead product;

comparing said first signal and said second signal and establishing a third signal which is responsive to the difference between said first signal and said second signal;

manipulating the heat supplied to said fractional distillation column in response to said third signal;



establishing a bias signal in response to said third signal;

establishing a fourth signal which is representative of the actual concentration of said first component in said bottoms product stream;

establishing a fifth signal which is representative of the desired concentration of said first component in said bottoms product stream;

comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal;

summing said bias signal and said sixth signal to establish a seventh signal; and

manipulating the flow rate of said external reflux in response to said seventh signal.

4,371,427
EXTRACTIVE DISTILLATION

Raymond E. Holler, and Loyal E. Henson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 16, 1981, Ser. No. 273,559
Int. Cl.³ B01D *3/42*
U.S. Cl. 203—3 **14 Claims**

13. In an extractive distillation process comprising

(a) introducing a hydrocarbon feed comprising a first component and a second component to be separated into an extractive distillation column,

(b) extractively distilling said hydrocarbon together with a stream of an extractive agent comprising a selective solvent and a required effective concentration of water in said extractive distillation column such as to form a first overhead stream and a first bottom stream,

(c) recovering said first component and a first stream of liquid water from said first overhead stream,

(d) introducing said first bottom stream into a stripper,

(e) introducing steam into the lower portion of said stripper,

(f) withdrawing a second overhead stream from said stripper,

(g) withdrawing a second bottom stream from said stripper,

(h) separating a second stream of liquid water from said second overhead stream,

(i) evaporating water from said second stream of liquid water and using the so evaporated water as said steam,

(j) withdrawing a selected solvent stream from said stripper, the improvement comprising

(k) introducing said second stream of liquid water and at least a portion of said first stream of liquid water into a water tank having a level controller associated therewith

which is capable of generating a level control signal responsive to the level of water in said tank,

(l) withdrawing a flow controlled stripper water stream and a distillation water stream from said water tank under conditions so that said effective concentration of water in said distillation water stream is controlled responsive to said level control signal,

(m) combining said selective solvent stream, any remainder of said first stream of liquid water and said distillation water stream to form said stream of said extractive agent.

4,371,428
SEPARATING VINYLTOLUENE FROM OTHER ALKENYLAROMATICS

John C. Montagna, O'Hara Township, Allegheny County; Robert D. Galli, New Kensington, both of Pa., and John Freel, Parker, Colo., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

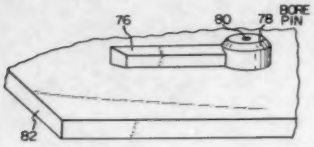
Filed Nov. 24, 1980, Ser. No. 209,596
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.³ B01D *3/40*
U.S. Cl. 203—51 **13 Claims**

1. The method of separating vinyltoluene in admixture with at least one close-boiling mono-olefinically unsaturated alkylaromatic compound by extractive distillation which comprises distilling said mixture comprising vinyltoluene and at least one close-boiling mono-olefinically unsaturated alkylaromatic compound in the presence of at least one liquid oxygen-containing, sulfur-containing or nitrogen-containing organic polar compound having a boiling point at 760 mm Hg of between about 185° and about 300° C., recovering a vapor phase rich in said close-boiling mono-olefinically unsaturated alkylaromatic compound and recovering a bottoms fraction comprising vinyltoluene and said organic polar compound.

4,371,429
TIMEPIECE HAND MANUFACTURING METHOD

Tadao Enomoto, and Hidefumi Kasai, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,112
Claims priority, application Japan, Aug. 25, 1980, 55-116720
Int. Cl.[3] C25D 1/20
U.S. Cl. 204—4 5 Claims



1. A method of forming a timepiece hand, comprising the steps of:

preparing a plastic matrix having a concave portion formed therein, with at least a part of said concave portion being formed into a shape which corresponds to that of a surface of said timepiece hand, said plastic matrix further having a convex portion formed to peripherally surround said concave portion;

forming a layer of electrically conductive material over said concave and convex portions of said plastic matrix;

partially removing said layer of electrically conductive material by grinding an uppermost area of said peripheral convex portion of said plastic matrix;

performing electro-forming to form a layer of a hard metal over the remaining areas of said layer of electrically conductive material;

performing grinding of an uppermost area of said peripheral convex portion of said plastic matrix to remove said layer of electrically conductive material and layer of electroformed hard metal therefrom, whereby an uppermost area of said peripheral convex portion of said plastic matrix forming a continuous path around said concave portion of said plastic matrix which is completely exposed from said layer of electrically conductive material and said electroformed layer of hard metal; and

immersing said peripheral convex portion of said plastic matrix in an organic solvent, to thereby dissolve and remove portions of said plastic matrix around said concave region thereof, whereby a timepiece hand comprising said layer of electrically conductive material and said electro-forming layer of hard metal formed on said concave portion becomes separated from said plastic matrix.

4,371,430
ELECTRODEPOSITION OF CHROMIUM ON METAL BASE LITHOGRAPHIC SHEET

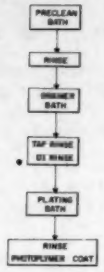
John A. Ballarini, and Timothy A. Hetland, both of Racine, Wis., assignors to Printing Developments, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 34,179, Apr. 27, 1979, abandoned. This application Apr. 11, 1980, Ser. No. 134,636
Int. Cl.[3] C25D 5/44; G03C 1/94
U.S. Cl. 204—32 R 14 Claims

1. In the direct electrodeposition of chromium on the surface of a metal substrate, the steps of

immersing said metal substrate in a controlled temperature grainer bath consisting of water and a bifluoride selected from the group consisting of ammonium bifluoride and sodium bifluoride and in a concentration of about 4 to 16 ounces of selected bifluoride per gallon of water, for at least 10 seconds;

immersing said bifluoride grained metal substrate with no intervening treatment other than optional rinsing in a plating bath selectively constituted of water, chromic oxide and sulfuric acid in amounts to maintain a CR^{+6}/SO_4^{-2} ratio in the range of about 75 to 180;



and exposing said immersed metal substrate in said plating bath to a plating current in the range of 300 to 1000 amperes per square foot for at least 30 seconds.

4,371,431
PHOTOELECTROCHEMICAL GENERATION OF THALLIUM(III)

Jay A. Switzer, Placentia, and Eric L. Mooreheaď, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 9, 1981, Ser. No. 310,310
Int. Cl.[3] C25B 3/00, 5/00
U.S. Cl. 204—59 R 35 Claims

1. A method for producing thallium(III) in solution which comprises:

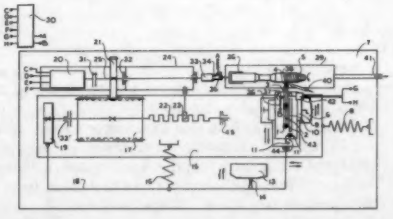
(a) placing a solution containing thallium(I) into a photoelectrochemical cell fitted with a semiconductor photoelectrode and a counter electrode, said photoelectrode and counter electrode having an electrical interconnection external to said cell; and

(b) exposing said photoelectrode to actinic radiation, generating a flow of current in said cell.

4,371,432
METHOD OF AND APPARATUS FOR ELECTROEROSIVE PRODUCTION OF PROFILED SURFACES

Yanko P. Kyuchukov, Varna, Bulgaria, assignor to UPZ kam Vimmess, Russe, Bulgaria

Filed Feb. 25, 1981, Ser. No. 238,125
Int. Cl.[3] B23P 1/04, 1/12; B23K 9/16
U.S. Cl. 204—129.35 5 Claims



5. A method for the production of shaped surfaces or workpieces by electroerosive machining at a machining zone, comprising feeding a flexible continuous round wire electrode toward the machine zone, and deforming the initially round electrode in a roll pass while it is being continuously fed to a

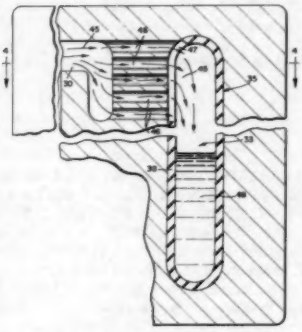
second shape in cross-section having at least one angle while it is being thus fed and before it reaches the machining zone.

4,371,433

APPARATUS FOR REDUCTION OF SHUNT CURRENT IN BIPOLAR ELECTROCHEMICAL CELL ASSEMBLIES

Edward N. Balko, Wilmington, Mass., and Lawrence C. Moulthrop, Stratham, N.H., assignors to General Electric Company, Wilmington, Mass.

Filed Oct. 14, 1980, Ser. No. 195,920
Int. Cl.³ C25B *15/06, 15/08, 9/00;* **H01M** *8/24*
U.S. Cl. 204—228 **5 Claims**



1. An electrochemical cell assembly comprising a plurality of electrochemical cells stacked together in an electrically series connected arrangement, each cell comprising:

(a) an ion exchange membrane positioned between and in contact with catalytic electrodes,

(b) a plurality of electrically conductive bipolar plates separating adjacent membranes, each of said plates having a plurality of electrode contacting projections on opposite faces which define a plurality of fluid distributing channels, each bipolar element contacting the electrodes associated with adjacent membranes,

(c) outlet manifold means in each of the bipolar elements communicating with the fluid distributing channels and aligned with the outlet manifold means in each of the remaining bipolar elements to form a common outlet manifold means for the cell assembly,

(d) means for introducing a conductive fluid to each cell which passes through the fluid distributing channels and into contact with an electrode, with excess fluid passing out of the cell into the outlet manifold means,

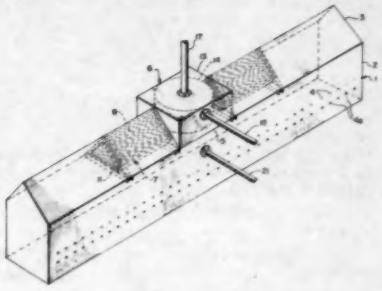
(e) means for preventing shunt current flow between cells and through the conductive fluid in the the manifolds, comprising elastomeric insulating means having a main body portion lining the manifold walls of each bipolar element, said main body having a pair of flange members extending therefrom and overlapping the flange members of the insulating means mounted on the adjacent bipolar plate to form a fluid-tight seal between adjacent plates and to prevent current flow between conductive manifold walls through the conductive fluid in the common manifold.

4,371,434

DEGASSER-DEHYDRATOR

Eugene L. Clarke, Rome, Italy, assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 22, 1981, Ser. No. 276,404
Int. Cl.³ B01D *17/04, 17/06, 19/00*
U.S. Cl. 204—302 **8 Claims**



1. A combined distributor-degasser for a dehydrating and degassing apparatus, said distributor-degasser comprising:

(a) a horizontally elongated inverted trough including a lower portion having orifices along its sides and an upper peaked portion having a central upwardly directed opening;

(b) demister means mounted in said central opening and communicating with said trough;

(c) defoamer means in the peaked portion of said inverted trough on each side of said demister means, said defoamer means communicating with said demister means;

(d) means associated with said trough for communicating with liquid-gas interface level control means; and

(e) gas outlet means in said demister means.

2. An apparatus for dehydrating and degassing oil-continuous emulsions containing gases and a dispersed aqueous phase, said apparatus comprising a treating vessel provided with emulsion inlet means and water, gas and treated oil outlet means, and being further provided in its lower portion with the distributor-degasser of claim **1**, said vessel emulsion inlet means communicating with the lower portion of said inverted trough, above said orifices, of said distributor-degasser and said vessel gas outlet means communicating with said demister means.

3. The apparatus of claim **2** wherein said treating vessel is provided also with an electrode system adapted to produce an electric treating field, and conductive means associated therewith.

4,371,435

PLACER MINING SLUICE

Colin Eckersley, 2185 Qualicum Dr., Vancouver, B.C., Canada (V5P 2M3)

Filed Oct. 22, 1981, Ser. No. 313,804
Int. Cl.³ B03B *5/26, 7/00*
U.S. Cl. 209—44 **11 Claims**

1. A mining sluice, comprising:

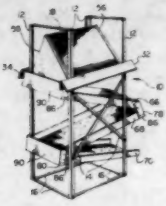
(a) an inverted generally V-shaped screen having first and second sides which slope downwardly and outwardly from a longitudinal axis of said screen;

(b) first and second panels for positioning at opposed ends of said screen axis to close said screen ends;

(c) a deflector pan having opposed first and second ends, said pan for positioning beneath said screen to extend between said first and second screen sides and between said first and second screen ends with said first end of said pan in contact with said first panel; and

(d) a first tray for positioning beneath said deflector pan and

screen at an angle relative to the horizontal and with the uppermost end of said first tray beneath said second end of



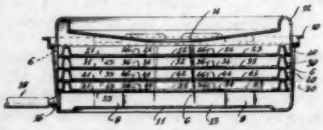
said pan whereby material passing through said screen may pass over said deflector second pan end onto said uppermost tray end.

4,371,436

PRECIOUS METAL RECOVERY APPARATUS

Mark I. Farber, Orange, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Jul. 6, 1981, Ser. No. 281,000
Int. Cl.³ B07B *1/04*
U.S. Cl. 209—268 **9 Claims**



1. A portable, countertop apparatus for recovering particles of a precious metal suspended in a liquid comprising:

a tray including a bottom surface, a pair of end walls and a pair of side walls;

a plurality of filters of successively smaller porosity through which a particle-containing liquid can be passed, each successive filter preventing precious metal particles of progressively smaller sizes suspended in said liquid from passing therethrough;

a frame assembly comprising a separate frame for each of said filters, each frame having a border to which corresponding filter material can be affixed, the perimeter of each frame being adapted to fit snugly within said tray for supporting said filters in horizontally stacked relation within said tray;

a plurality of ribs situated on each of said frames inwardly of the perimeter edges of the frame;

a tray cover situated on top of said tray, said cover having an opening therein into which liquid can be manually poured; and

a drainage port in communication with the interior of said tray to allow liquid poured into the tray and passing through the filters to drain out of the tray.

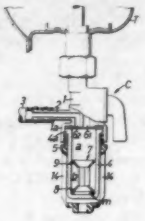
4,371,437

FUEL SEDIMENTATION DEVICE

Hiroyuki Iwasaki, Urawa, and Kiyoshi Kasahara, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,435
Claims priority, application Japan, Mar. 15, 1980, 55-33850[U]
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—94 **5 Claims**

1. A sedimentation device for purifying liquid comprising a sedimentation cup having an inlet and an outlet formed at its top, and a partition means for vertically dividing the interior of said cup into at least two, upper and lower chambers, said partition means comprising a partition plate in the form of a funnel having a passage bore formed centrally therethrough and a sediment-guiding surface descending toward said passage bore, and a base plate in the form of a funnel symmetrical



with said partition plate, disposed on the bottom of said sedimentation cup and connected with said partition plate through a plurality of supporting columns and in said base plate having a magnet attached to the lower side thereof.

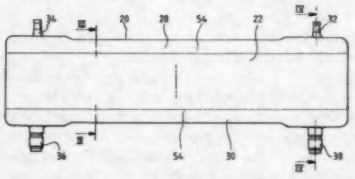
3. A sedimentation device according to claim **1**, wherein said sedimentation cup is formed of transparent glass.

4,371,438

FLUID TREATMENT APPARATUS, A CASING FOR ENCLOSING AND COMPRESSING A STACK OF FLAT ELEMENTS THEREIN, AND A PROCESS FOR MAKING SUCH AN APPARATUS

Robert Benattar, Lyons, and Michel Cronenberger, Givors, both of France, assignors to SODIP, Meyzieu, France

Filed Jun. 27, 1980, Ser. No. 163,820
Claims priority, application France, Jul. 17, 1979, 79 18981
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—232 **26 Claims**

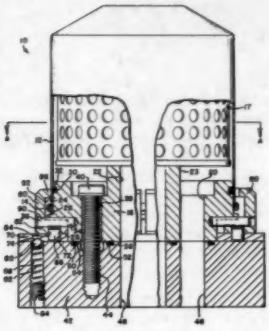


18. Fluid treatment apparatus comprising a casing, a stack of flat elements positioned in said casing, said casing comprising two endplates between which the stack is arranged, internal faces of the said endplates being in contact with the faces of the stack which are substantially parallel to the plane of the elements, at least two lateral plates, internal surfaces of said lateral plates located in front of the two lateral faces of the stack, a plurality of studs and recesses on adjacent surfaces of the lateral plates and the endplates, and cooperatingly engaged surfaces on said studs and said recesses, effective to connect said lateral plates and endplates together and to hold said endplates so that said stack is compressed, the cooperating engagement surfaces of the said studs and recesses having no locking means and being at right angles to the plane of the lateral face of the stack in front of which is located the lateral plate carrying the studs or recesses, the edges of the lateral plates corresponding to the lateral edges of the endplates having rims which cover the marginal zones of the lateral edges of said endplates and are to be attached with them.

4,371,439
CAM ACTUATED FILTER ASSEMBLY

Donald I. Thornton, Warwick, R.I., assignor to Fram Corporation, East Providence, R.I.

Continuation of Ser. No. 147,979, May 8, 1980, abandoned. This application Jun. 12, 1981, Ser. No. 273,163
Int. Cl.³ B01D 27/08
U.S. Cl. 210—232 4 Claims



1. A filter assembly comprising:
a housing within which a filter element is disposed;
a support for sealingly receiving the housing to enclose said filter element therebetween, said support carrying a plurality of radially outwardly projecting members;
a plurality of circumferentially extending jaws carried by said support and circumscribing said support and said housing for clamping the housing against the support, each of said jaws having radially extending bores slidably receiving a corresponding one of the radially projecting members to thereby mount the jaws for radial movement toward and away from clamping engagement with said housing;
a cam member mounted for rotation relative to the support and having a slot for each of said jaws, each of said jaws further including an axially extending projection engaging a corresponding slot in said cam member, the slots in said cam member being oriented to move the axially extending projections and therefore said jaws radially along said radially projecting members upon rotation of said camming member.

4,371,440
METHOD OF TREATING A WASTE WATER RICH IN PROTEIN

Kiyoshi Yoshizawa, Tokyo; Kenichi Otsuka, Higashiooizumi; Kikuo Nojiro, Machida; Takeo Koizumi, Yokohama; Katsuyoshi Mitsutomi, Ushiku, and Seiji Nakamura, Kashiwa, all of Japan, assignors to National Tax Administration Agency and Toh Zinc Company Limited, both of Tokyo, Japan

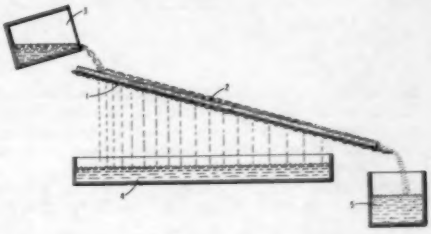
Filed Sep. 23, 1981, Ser. No. 304,965
Int. Cl.³ C02F 3/34
U.S. Cl. 210—601 1 Claim

1. A method of treating a waste water rich in protein, comprising:
adding to a waste water rich in protein at least one yeast capable of assimilating a high amount of protein, said at least one yeast being selected from the group consisting of
Saccharomyces sp. KB 14-1, FERM-P No. 4886,
Candida sp. KB 8, FERM-P No. 4885,
Candida sp. 3B, FERM-P No. 4884, and
Trichosporon sp. 1B, FERM-P No. 4887,
thereby causing said yeast to assimilate protein; and
flowing the obtained waste water into an activated sludge tank in which the obtained waste water is treated with an activated sludge.

4,371,441
PROCESS AND APPARATUS FOR THE SEPARATION OF IMMISCIBLE LIQUID MIXTURES

Nikolaus Mathes, Breuberg; Hans J. Pitowski, Miltenberg, both of Fed. Rep. of Germany, and Gunther Vitzthum, Enka, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 107,956, Dec. 28, 1979, abandoned, which is a continuation of Ser. No. 870,257, Jan. 17, 1978, abandoned. This application Feb. 3, 1981, Ser. No. 231,090
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701759
Int. Cl.³ B01D 17/02
U.S. Cl. 210—649 2 Claims



2. A process for the separation of mixtures of liquids insoluble in each other by means of nonwoven fibrous sheet structures, comprising bringing the mixtures of liquids into contact, under static liquid pressure, without additional pressure, with one side of a sheet structure comprising fibers or filaments permeable to only one of the liquids and nonpermeable to said other liquid, wherein the nonwoven sheet structure is produced on a paper machine, and said nonwoven is composed of a blend of 15 wt. % viscose fiber, 20 wt. % nylon 6 fiber, 50 wt. % of a fiber of copolyamide of 20% nylon salt and 80% caprolactam having a shrinkage capacity of at least 25%, and 15 wt. % bonding fiber and consolidated by thermal treatment of the wet nonwoven, whereby said permeable liquid is prevented from passing through said sheet structure and collecting the liquids separately.

4,371,442
METHOD FOR OBTAINING DISSOLVED SUSPENDED OR CHEMICALLY BOUND SUBSTANCES FROM A LIQUID

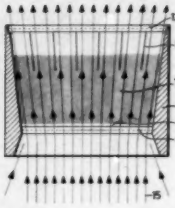
Hans G. Bals, Glenhausen-Hailer, Fed. Rep. of Germany, assignor to Uranerzbergbau GmbH & Co. KG, Bonn, Fed. Rep. of Germany

Division of Ser. No. 882,447, Mar. 1, 1978, abandoned, which is a continuation of Ser. No. 741,130, Nov. 11, 1976, abandoned. This application Apr. 16, 1981, Ser. No. 254,736
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550751
Int. Cl.³ B01D 15/02
U.S. Cl. 210—661 2 Claims

1. The method of obtaining chemical substances from a liquid by a bed of adsorbent particles, comprising the steps of:
establishing a bed of adsorbent particles of a specific gravity greater than that of the liquid within a container channel,
flowing the liquid at a continuous steady flow rate in a path passing upwardly through the bed at a velocity chosen to suspend the particles in a quasi-stationary position within the liquid separated from each other so that the particles are wetted on their entire surfaces and do not tend to collide with each other to erode accumulated chemicals from the water,

stabilizing the liquid flow to reduce turbulence in the bed and to distribute the particles substantially uniformly across the bed by providing in the liquid path before it reaches the bed a resistance to liquid flow which is at least one third of the resistance to flow established by said bed,

permitting the particles in the bed to acquire chemical substances from the liquid which increase their specific gravity thereby to migrate in the liquid flow path by the action



of gravity substantially due only to the accumulated chemicals as a bed without significant movement of the particles relative to each other within the liquid, thereby to reduce contact between the particles and with the container channel, and

withdrawing from the bed those particles having greater specific gravity from accumulated chemicals deposited thereon from the liquid.

4,371,443

METHOD OF AND COMPOSITION FOR ACIDIZING SUBTERRANEAN FORMATIONS

Bill R. Keeney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 9, 1981, Ser. No. 232,785
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **14 Claims**

1. An acidic composition comprising:

(a) an aldehyde selected from the group consisting of formaldehyde, acetaldehyde, propionaldehyde, glyoxal, butoxyaldehyde, trioxine, and paraformaldehyde;

(b) an ammonium salt selected from the group consisting of ammonium fluoride, ammonium bifluoride, ammonium chloride, ammonium sulfate and ammonium nitrate present in an amount sufficient to react with said aldehyde to form an acid; and

(c) a chemical additive selected from the group consisting of acetic acid, an alkali metal salt of said acetic acid, an ammonium salt of said acetic acid, formic acid, an alkali metal salt of formic acid, an ammonium salt of said formic acid, mixtures thereof and mixtures with hexamethylenetetramine, said additive being and present in an amount sufficient to retard said reaction of said aldehyde to form said acid.

4,371,444

PROCESS FOR SECONDARY RECOVERY

David R. McCoy, and Carter G. Naylor, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 112,582, Jan. 16, 1980, abandoned. This application May 8, 1981, Ser. No. 261,853
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **21 Claims**

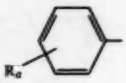
1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein:

(a) from 0.05 to about 6.0 weight percent of a nonionic surfactant of the formula:

$$RO(CH_2CH_2O)_m(CH_2CH(OH)CH_2O)_nH,$$

wherein R is selected from the group consisting of alkyl of from 8 to about 20 carbon atoms and



wherein R_a is branched or linear alkyl of from 6 to about 18 carbon atoms, wherein m is an integer of from 1 to about 20 and n is an integer of from 1 to about 8, and

(b) about 0.03 to about 5.0 weight percent of a surfactant selected from the group consisting of an anionic sulfonate and an anionic sulfate surfactant,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well.

4,371,445

ARRANGEMENT IN PAIRS OF PLASTIC SLIDING ON PLASTIC IN TRIBOLOGIC SYSTEMS

Heinz Faigle, Hard, Austria, assignor to Heinz Faigle KG, Hard, Austria

Filed Jun. 18, 1979, Ser. No. 49,163
Claims priority, application Austria, Mar. 14, 1979, 1930/79
Int. Cl.³ C10M *5/10, 5/00*
U.S. Cl. 252—12 **21 Claims**

1. In a tribological system with plastic/plastic pairings, in which plastics carry out motions in sliding friction relative to one another and in which at least one of the main sliding partners or auxiliary partners is a plastic, containing polar, cyclic compounds, in which the cyclic part of the molecule on at least one side is coupled directly to an atom of Group V or of Group VI of the Periodic System of the elements, or in which the rings contain the atoms mentioned, the improvement which comprises said polar plastic materials containing one or more cyclic compounds selected from the group consisting of:

(a) monovalent cyclic chain polymers,

(b) chain polymers in the form of polyheterocycles,

(c) chain polymers in the form of monovalent polyheterocycles,

(d) fully cyclic chain polymers, and

(e) homopolymers, copolymers, polymer mixtures from groups (a) to (d);

and wherein both main sliding partners are polar and contain different cyclic compounds, are different atoms or chemical groups which are coupled to the cyclic part, in which case the auxiliary sliding partner is nonpolar, or both main sliding partners are nonpolar and the auxiliary sliding partner is polar and contains said cyclic compounds.

4,371,446

LUBRICANT

Hirotsugu Kinoshita, Kawasaki; Hiroshi Uemura, Machida, and Makoto Sekiya, Kawasaki, all of Japan

Filed Nov. 7, 1980, Ser. No. 205,375
Claims priority, application Japan, Nov. 15, 1979, 54/147135; Aug. 29, 1980, 55/118336
Int. Cl.³ C10M *1/26, 1/36*
U.S. Cl. 252—51.5 A **19 Claims**

1. Method of lubricating sliding surfaces composed of metal or non-metallic materials in sliding contact with each other which comprises applying to such sliding surfaces an effective lubricating amount of a lubricant comprising as a major component a dioleate compound of the formula

$$(R^3NH_2CH_2CH_2NH_3)^{++}2(OOCR^4)^-$$

in which R^3 is the corresponding hydrocarbon radical of a tallow fatty acid and R^4 is an oleyl radical and about 5 to 30% by weight of a diamide compound of the formula $R^2CO—NHR^1HN—CO—R^2$ in which R^1 is an alkylene radical having 2 to 4 carbon atoms, and R^2 is selected from the group consisting of an alkyl radical and an alkenyl radical, each correspondingly having 14 to 18 carbon atoms.

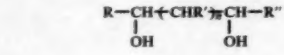
4,371,447

LOW VISCOSITY WATER-IN-OIL MICROEMULSIONS

Thomas H. Webb, Solon; Hugh F. Vest, Parma, and Keng S. Chan, South Euclid, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Jul. 6, 1981, Ser. No. 280,413
Int. Cl.³ C09K 5/00
U.S. Cl. 252—73 **8 Claims**

1. A water-in-oil microemulsion comprising:
(a) an oil phase
(b) an aqueous phase
(c) at least one emulsifier, and
(d) at least one aliphatic diol of the formula



(I)

where
R and R″ are independently hydrogen or C_1–C_{18} aliphatic groups,
each R′ is independently hydrogen or a C_1–C_{20} aliphatic group,
n is an integer of 1–4, with the provisoes that
the number of carbon atoms in R is different than the number of carbon atoms in R″, and
the total number of carbon atoms in I is from 5 to about 25.

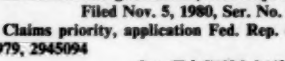
4,371,448

HYDRAULIC FLUID COMPOSITION WITH IMPROVED PROPERTIES BASED ON BORIC ACID ESTERS, GLYCOL MONO-ETHERS AND BIS-(GLYCOLETHER) FORMALS

Wolfgang Knoblauch, Burghausen, and Konrad von Werner, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

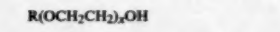
Filed Nov. 5, 1980, Ser. No. 204,326
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945094
Int. Cl.³ C10M 3/48
U.S. Cl. 252—78.1 **8 Claims**

1. Hydraulic fluid essentially consisting of
(A) 20 to 40% by weight, relative to the weight of the total fluid, of a boric acid ester which is obtained when ortho-boric acid, diethylene glycol and an ethylene glycol monoalkyl ether of the formula I



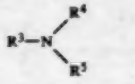
(I)

in which R is an alkyl group with 1 to 4 C atoms and x is an integer from 2 to 4, are reacted in a molar ratio of 1:1:1 at a temperature of 50° to 150° C., the water of reaction formed being removed continuously;
(B) 30 to 60% by weight, relative to the weight of the total fluid, of at least one ethylene glycol monoalkyl ether of the formula I in which R and x have the meaning given;
(C) 10 to 40% by weight, relative to the weight of the total fluid, of at least one bis-(ethylene glycol monoalkyl ether)-formal of the formula II



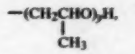
(II)

wherein R^1 and R^2 denote an alkyl group with 1 to 4 C atoms and n_1 and n_2 denote an integer from 1 to 4;
(D) 0.1 to 5% by weight, relative to the weight of the total fluid, of at least one alkylamine of the formula III

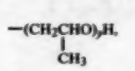


(III)

in which R^3 denotes an alkyl or monounsaturated alkenyl group with 1 to 18 C atoms, R^4 denotes hydrogen, $—(CH_2CH_2O)_yH$ or



in which y is an integer from 1 to 5, and R^5 denotes hydrogen, $—(CH_2CH_2O)_yH$ or



in which y is an integer from 1 to 5, or an alkyl or monounsaturated alkenyl group with 1 to 18 C atoms, with the proviso that the sum of the C atoms in R^3 and R^5 in formula III is not greater than 18; and
(E) 0.05 to 5% by weight, relative to the weight of the total fluid, of at least one ingredient selected from the group consisting of a pH stabilizer, a corrosion inhibitor, and an antioxidant.

4,371,449

PRODUCT FOR DELINTING COTTONSEED

Richard L. Smith, Jr., East Point, Ga., assignor to SSC Industries, Inc., East Point, Ga.

Division of Ser. No. 4,408, Jan. 18, 1979, Pat. No. 4,216,616.
This application Dec. 3, 1979, Ser. No. 99,548
Int. Cl.³ C11D 7/08, 1/825
U.S. Cl. 252—142 **13 Claims**

1. A product for use in the process of delinting of cottonseed consisting essentially of a mixture of sulfuric acid having a concentration of 40% or more H_2SO_4 and a foaming agent stable to sulfuric acid in sufficient quantity to produce a stable foam, said foaming agent being a fatty amide which is a reaction product of an amine and a coconut product selected from the group consisting of coconut fatty acid and coconut oil.

4,371,450

VANADIUM-COBALT CORROSION INHIBITOR SYSTEM FOR SOUR GAS CONDITIONING SOLUTIONS

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 12, 1981, Ser. No. 243,217
Int. Cl.³ B01D 47/02, 53/34; C23F 11/14, 11/18
U.S. Cl. 252—189 **14 Claims**

1. A corrosion inhibited composition consisting essentially of an aqueous alkanolamine solution employed in acid gas removal service and an inhibiting amount of a combination of
an anion containing vanadium in the plus 4 or plus 5 valence state and
an anion containing cobalt in the plus 2 valence state.

4,371,451
LECITHIN CONTAINING SURFACE RELEASE COMPOSITIONS

Frank Scotti, 450 Indian Rd., Wayne, N.J. 07470, and Edward H. Page, 1021 Hillcrest Rd., Ridgewood, N.J. 07450

Filed Feb. 10, 1982, Ser. No. 347,568
Int. Cl.³ C08L *91/00*
U.S. Cl. 252—305 **21 Claims**

1. A cookware surface release composition comprising water, lecithin, and dimethylether adapted to be dispensed under dimethylether propellant pressure from an aerosol container, wherein the lecithin is dispersed in a solution of the dimethylether and water, and the dimethylether is present in an amount sufficient to propel the lecithin dispersion from an aerosol container and onto a cookware surface without foaming.

4,371,452
PROCESS FOR HYDROCARBON REFORMING AND APPARATUS THEREFOR

Kozo Ohsaki, Funabashi; Kazuo Hirokawa; Goro Fukuda, both of Chiba; Kozi Otsuka, Mobara, and Tadayoshi Tomita, Yokohama, all of Japan, assignors to Toyo Engineering Corporation, Japan

Continuation of Ser. No. 149,638, May 14, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 328,822
Claims priority, application Japan, May 18, 1979, 54/60271
Int. Cl.³ C01B *3/38*
U.S. Cl. 252—373 **2 Claims**

1. In a process for reforming hydrocarbons in which a gaseous mixture of a sulfur-containing liquid hydrocarbon selected from the group consisting of kerosene, gas oil and vacuum distillation gas oil, and an oxidizing agent for reforming is brought into contact with a catalyst to convert the mixture into a mixed gas containing hydrogen and carbon monoxide, the improvement comprising:

(a) evaporating by heating said liquid hydrocarbon in the mixture of said oxidizing agent to form said gaseous mixture at a temperature of from 350° C. to 600° C.;

(b) further heating said gaseous mixture from step (a) to a temperature above 800° C. while passing said gaseous mixture through a bed of aluminum oxide and an alkali metal oxide and/or alkaline earth metal oxide;

(c) passing said gaseous mixture from step (b) through a nickel-containing catalyst bed at a temperature above 800° C. to convert said gaseous mixture into said mixed gas, said nickel-containing catalyst being composed of at least one metal oxide selected from oxides or beryllium, magnesium, calcium, strontium, barium and aluminum with nickel incorporating therein, whereby the sulfur compound contained in said liquid hydrocarbon is converted into readily desulfurizable H_2S and/or COS; and

(d) passing said mixed gas discharged from step (c) countercurrently to the flow of said gaseous mixture of sulfur-containing liquid hydrocarbon and oxidizing agent in a heat-exchange zone passing through said bed of step (b) and said catalyst bed of step (c), whereby the sensible heat of said discharged mixed gas is utilized in said reforming and for heating up said gaseous mixture.

4,371,453
FLUID CATALYST REGENERATION PROCESS AND APPARATUS

Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 20, 1981, Ser. No. 265,502
Int. Cl.³ B01J *29/38, 21/20*; C10G *11/18*
U.S. Cl. 252—417 **3 Claims**

1. A process for regenerating a coke-contaminated fluid catalyst, said process including the steps of:

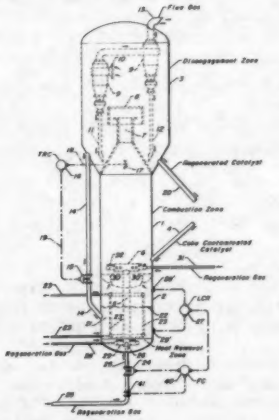
(a) introducing oxygen-containing regeneration gas, coke-contaminated fluid catalyst into a lower locus of a combustion zone maintained at a temperature sufficient for coke-oxidation and therein oxidizing coke to produce hot regenerated catalyst and hot flue gas;

(b) transporting said hot flue gas and a portion of said hot regenerated catalyst into a regenerated catalyst disengaging zone, wherein said hot regenerated catalyst is separated from said flue gas;

(c) passing a portion of hot regenerated catalyst from said disengaging zone to a heat removal zone and therein maintaining said catalyst at dense-phase fluid bed conditions, said combustion and heat removal zones being substantially vertically oriented with respect to each other with said heat removal zone below said combustion zone;

(d) removing heat in said heat removal zone by providing heat removal means at least partially immersed in said dense-phase fluid catalyst bed of said heat removal zone;

(e) passing relatively cool catalyst from said heat removal zone to said combustion zone through a substantially vertical transfer line having an inlet in a lower locus of said dense-phase fluid bed in said heat removal zone and an outlet in a lower locus of said combustion zone, said passing of relatively cool catalyst effected by passing at least a portion of said regeneration gas into said transfer line at a locus below the level of said dense-phase fluid bed; and



(f) controllably maintaining the extent of immersion of said heat removal means in said dense-phase fluid catalyst bed by maintaining the level of said dense-phase fluid catalyst bed in said heat removal zone by controlling the quantity of said regeneration gas passed into said transfer line in response to said level.

2. Process of claim 1 further characterized in that the temperature at an upper locus of said combustion zone is controllably maintained by controlling the quantity of said hot regenerated catalyst passed from said disengaging zone to said heat removal zone in response to said temperature at said upper locus.

3. Process of claim 1 further characterized in that fluidization of said dense-phase fluid catalyst bed in said heat removal zone is effected by introducing at least a portion of said regeneration gas into a lower locus of said bed and venting said portion from said removal zone to a lower locus of said combustion zone.

4,371,454

PROCESS FOR PREPARING SPHERICAL CARBON MATERIAL AND SPHERICAL ACTIVATED CARBON

Kaji Hisatsugu, and Kazuhiro Watanabe, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,927
Claims priority, application Japan, Nov. 2, 1979, 54-142154; Nov. 2, 1979, 54-142155; Apr. 15, 1980, 55-49925
Int. Cl.³ C01B 31/02
U.S. Cl. 252—422 3 Claims

3. A process for preparing spherical activated carbon, comprising the steps of:

heating while continuously stirring an admixture of (a) 100 parts by weight of a mixture of 30 to 95 weight percent of a pitch and 5 to 70 weight percent of amorphous carbon particles having a diameter smaller than 200 microns and (b) 5 to 50 parts by weight of a viscosity-controlling agent, thereby fluidifying uniformly said admixture;

extruding the fluidified admixture from an extrusion die, thereby forming the fluidified admixture into a string-like shape;

cooling the formed admixture having a string-like shape;

cutting the cooled admixture having a string-like shape into fragments having a stick-like shape;

putting the fragments into hot water kept at a temperature higher than the softening point of said admixture, thereby obtaining spherical particles of said admixture;

removing said viscosity-controlling agent from the obtained sphere;

infusibilizing the resultant spherical particles with an aqueous solution of an oxidant selected from the group consisting of nitric acid, sulfuric acid, persulfuric acid, peracetic acid, permanganate, dichromate, a salt of halogen oxyacid and a mixture thereof;

carbonizing the infusibilized spherical particles; and

activating the carbonized spherical particles.

4,371,455

SUPPORTED CATALYST FOR OLEFIN POLYMERIZATION

Mark P. Mack, and Charles T. Berge, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Dec. 21, 1981, Ser. No. 332,417
Int. Cl.³ C08F 4/02, 4/64
U.S. Cl. 252—429 C 11 Claims

1. A method for forming a supported activated catalyst for olefin polymerization comprising

(a) reacting magnesium metal with an organic halide or halides to yield a dialkyl magnesium composition, magnesium dihalide and unreacted magnesium metal;

(b) separating the magnesium dihalide and magnesium metal from the dialkyl magnesium composition in the substantial absence of oxygen and moisture, then treating the magnesium dichloride and magnesium metal with alkyl halides or aryl halides or mixtures of these to form an organometallic substance in situ;

(c) adding transition metal halides to the mixture of (b) or adding (b) to transition metal halides, allowing reaction to occur and removing unreacted alkyl and aryl halides as well as unreacted transition metal halides before

(d) adding alkylating agents to form a polymerization catalyst.

4,371,456

CATALYST FOR DIRECT HYDRATION OF ETHYLENE TO ETHYL ALCOHOL AND PROCESS FOR PREPARATION THEREOF

Vlastimil Kadlec, Litvinov; Vojtech Grosser, Rudolice, and Jakub Rosenthal, Mezibori u Litvinova, all of Czechoslovakia, assignors to Chemopetrol, koncernovy podnik, Chemicke zavody ceskoslovenskosovetskeho pratelstvi, Litvinov, Czechoslovakia

Filed Apr. 17, 1981, Ser. No. 255,221
Claims priority, application Czechoslovakia, Apr. 18, 1980, 2734-80
Int. Cl.³ B01J 21/08, 27/16
U.S. Cl. 252—435 6 Claims

1. Catalyst for direct hydration of ethylene to ethyl alcohol consisting of phosphoric acid on a silicon dioxide base characterized in that said catalyst consists of active synthetic silicon dioxide and natural kieselguhr in a weight ratio ranging from 1:0.2 to 1:4, and phosphoric acid in an amount ranging from 20–50 weight percent based on the weight of the catalyst.

4,371,457

ZEOLITES MODIFIED WITH GROUP VA METALS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 201,899, Oct. 29, 1980, Pat. No. 4,302,621. This application Dec. 19, 1980, Ser. No. 218,312
Int. Cl.³ B01J 27/18, 29/06
U.S. Cl. 252—437 10 Claims

1. A catalyst composition comprising:

a crystalline zeolite material characterized by a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12, said zeolite being selected from ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 and ZSM-48;

said zeolite further comprising at least 0.25 weight percent of one or more Group VA metals incorporated into said zeolite in the form of a Group VA metal oxide and at least 0.25 weight percent of phosphorus incorporated into said zeolite in the form of an oxide of phosphorus.

4,371,458

CATALYTIC COMPOUNDS EMPLOYING ALUMINA PROMOTED WITH ZINC, TITANIUM, COBALT AND MOLYBDENUM AS THE CATALYTIC AGENT

Alan D. Eastman, and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,437, Feb. 28, 1980, Pat. No. 4,287,050. This application Apr. 28, 1981, Ser. No. 258,250
Int. Cl.³ B01J 27/02, 23/16
U.S. Cl. 252—439 7 Claims

1. A catalyst composition comprising catalytic grade alumina, zinc titanate, cobalt, and molybdenum.

4,371,459

FLEXIBLE SCREEN-PRINTABLE CONDUCTOR COMPOSITION

Nicholas Nazarenko, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1981, Ser. No. 331,893
Int. Cl.³ H01B 1/02
U.S. Cl. 252—514 16 Claims

1. A screen printable conductor composition comprising

a. 70–90% weight, basis total solids, of a conductive phase consisting essentially of finely divided particles of (1) 50–95% weight silver, and (2) 50–5% weight of a base metal selected from the group consisting of aluminum, tin and nickel and mixtures thereof dispersed in a solution of

b. 30–10% weight, basis total solids, of polymers consisting essentially of (1) 10–65% weight of a multipolymer prepared by copolymerization of vinyl acetate, vinyl chloride

and 0.3–10% weight ethylenically unsaturated dicarboxylic acid in which the weight ratio of vinyl chloride to vinyl acetate is from 3 to 8 and (2) 90-35% by weight of a linear aromatic polyester resin having an intrinsic viscosity of 0.5-1 dissolved in

c. volatile nonhydrocarbon polar solvent in which the solvent has a boiling range of 150°–220° C.

4,371,460

BICYCLIC COMPOUNDS AND UTILIZATION THEREOF AS PERFUMING AGENTS

Ferdinand Näf, Carouge; Rene Decorzant, and Karl H. Schulte-Elte, both of Onex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

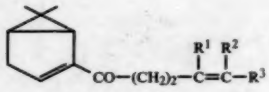
Filed Dec. 22, 1981, Ser. No. 335,196

Claims priority, application Switzerland, May 22, 1980, 4008/80

Int. Cl.³ C07C *49/557;* A61K *7/46*

U.S. Cl. 252—522 R 4 Claims

1. A compound of formula (I)



(I)

wherein each of symbols R^1, R^2 and R^3, identical or different, represents a hydrogen atom or a lower alkyl radical having 1 to 3 carbon atoms, preferably a methyl group.

2. Utilization of at least one of the compounds of formula (I) according to claim 1 as perfuming agent for the preparation of perfumes and perfumed products.

4,371,461

LIQUID DETERGENT COMPOSITIONS WITH TERTIARY ALCOHOL SKIN FEEL ADDITIVES

Keith A. Jones, Fairfield, Ohio, and Harry S. Walker, Jr., Bryn Mawr, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 193,050, Oct. 2, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 299,692

Int. Cl.³ C11D *3/20, 3/46, 3/48, 17/08*

U.S. Cl. 252—547 8 Claims

1. A liquid detergent composition containing by weight:

(a) from about 10% to about 50% of a detergent surfactant;

(b) from 0% to about 15% of a suds stabilizing nonionic surfactant selected from the group consisting of amine oxides, fatty acid amides, and the ethylene oxide condensates of alcohols and alkyl phenols;

(c) from about 0.01% to about 0.6% of linalool; and

(d) balance water and alcohol

said composition being essentially free of aldehydes and primary alcohols with structures like linalool and having a pH in use of less than about 8.5.

4,371,462

METHOD FOR PURIFICATION OF ANTERIOR PITUITARY HORMONES

Randy I. Hecht, Rockville, Md., assignor to Genex Corporation, Rockville, Md.

Filed Jan. 21, 1982, Ser. No. 341,216

Int. Cl.³ A61K *35/55;* C07G *7/00*

U.S. Cl. 260—112 R 23 Claims

1. A process of purifying anterior pituitary hormone which comprises eluting an anterior pituitary hormone-containing mixture on an anion-exchange column with a buffer solution, separating the eluate on an isoelectric focusing column, and retaining the fractions collected at or near the isoelectric point of the anterior pituitary hormone.

4,371,463

ENZYME-RESISTANT OPIATE PENTAPEPTIDES

Candace B. Pert, Bethesda, Md., and Jaw-Kang Chang, Pullerton, Calif., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 17, 1977, Ser. No. 769,686

Int. Cl.³ C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 E 3 Claims

1. A compound of the formula

H-Tyr-Sar-Gly-Phe-Y-R

wherein Y is Leu or Met; R is OH or NH_2; and the stereochemical configuration of each of the optically active amino acid residues is L.

4,371,464

DIPEPTIDE SWEETENER

Wilhelmus H. J. Boesten, Sittard, and Lambertus A. C. Schiepers, Maastricht, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

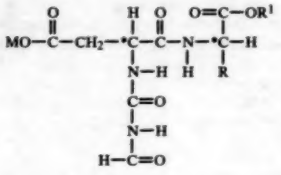
Filed Sep. 1, 1981, Ser. No. 298,521

Claims priority, application Netherlands, Sep. 4, 1980, 8005006

Int. Cl.³ C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 3 Claims

1. Compounds having the general formula

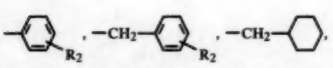


Formula I

wherein

M represents hydrogen, ammonium, alkali or alkaline earth,

R respesents



R_1 represents methyl, ethyl, or propyl,

R_2 represents —OH, or —OCH_3,

* signifies an L-optical configuration for this atom.

4,371,465

MAMMALIAN COLLAGENASE INHIBITORS

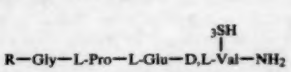
William H. McGregor, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,367

Int. Cl.³ C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 2 Claims

1. A compound of the formula:



in which

R is hydrogen, alkanoyl of 2 to 6 carbon atoms, cycloalkylcarbonyl of 6 to 8 carbon atoms or alkoxycarbonyl of 2 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,371,466

MAMMALIAN COLLAGENASE INHIBITORS

William H. McGregor, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,369
Int. Cl.³ C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 R **4 Claims**

1. A compound of the formula:

$$X—R_1—R_2—[R_3]_n—NH_2$$

in which

X is hydrogen, alkanoyl of 2 to 6 carbon atoms, cycloalkylcarbonyl of 6 to 8 carbon atoms or alkoxycarbonyl of 2 to 6 carbon atoms;

R_1 is Cys-, 3-mercapto-Val-, p-Glu-Cys-, p-Glu-3-mercapto-Val- or Pro-Gln-Gly-;

R_2 is Leu-, Ile- or Val-;

R_3 is Ala-, Ala-Gly- or Ala-Gly-Arg-; and

n is 0 or 1;

or a pharmaceutically acceptable salt thereof.

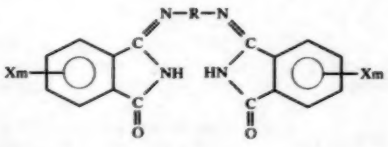
4,371,467

PROCESS FOR PRODUCING ISOINDOLINONE PIGMENTS

Hirohito Ando, and Naoki Furukawa, both of Hazaki, Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,504
Claims priority, application Japan, Oct. 3, 1979, 54/126886
Int. Cl.³ C07D *209/50, 401/14, 403/14, 417/14*
U.S. Cl. 260—165 **6 Claims**

1. A process for producing an isoindolinone pigment, which comprises (1) dispersing a salt formed from an isoindolinone compound of the formula



wherein X represents a chlorine or bromine atom, R represents 1,2-, 1,3- or 1,4-phenylene group, 2,2′ or 4,4′-diphenylene group, 4,4′-diphenylenesulfide group, 4,4′-diphenyleneurea group, stilben-4,4′-ylene group, benzoylanilin-4,4′-ylene group, azobenzen-4,4′-ylene group, 4,4′-diphenyleneether group, 4,4′-diphenylenemethane group, 1,4-naphthylene group, pyridin-2,6-ylene group, pyridin-2,5-ylene group, benzothiazole-2,5-ylene group or carbazol-3,6-ylene group, these groups being optionally substituted by a lower alkyl group, a lower alkoxy group or a halogen atom and m is 0 or an integer of 1 to 4, and a base, in water, and then (2) adding thereto an organic solvent not miscible freely with water to hydrolyze the salt.

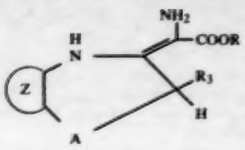
4,371,468

INTERMEDIATES TO PRODUCE IMIDAZODIAZEPINES

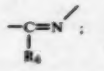
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 16, 1981, Ser. No. 244,511
Int. Cl.³ C07D *243/16, 487/04, 401/04, 487/14*
U.S. Cl. 260—239 BD **1 Claim**

1. A compound of the formula

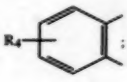


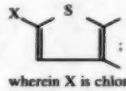
wherein R is lower alkyl; A is



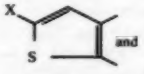
R^3 is selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro pyridyl; R_4 is selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkyl, nitro, cyano, mono-or di-lower alkyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; and

is selected from the group consisting of

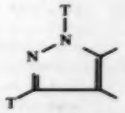




wherein X is chlorine, bromine, iodine or hydrogen



and



wherein X is chlorine, bromine, iodine or hydrogen

wherein T is hydrogen or lower alkyl

4,371,469

PROCESS FOR THE PREPARATION OF BRANCHED CHAIN FATTY ACIDS AND ESTERS

Thomas A. Foglia, Lafayette Hill; Theodore Perlstein; Yoshio Nakano, both of Philadelphia, and Gerhard Maerker, Oreland, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 28, 1981, Ser. No. 258,482
Int. Cl.³ C09F *7/08*
U.S. Cl. 260—405.6 **11 Claims**

1. In a process for the preparation of complex mixtures of branched chain fatty acids or esters wherein monounsaturated fatty acids or esters or mixtures thereof are heated in the presence of a catalyst, the steps by which the yield of monomeric branched chain products is substantially increased and the yield of polymeric products is substantially decreased, comprising:

(a) heating a predominantly monounsaturated fatty acid or

ester or mixture thereof at increased pressure in the presence of an acid catalyst and two co-catalysts until the reaction is completed;

(b) cooling the reaction mixture;

(c) venting off gaseous products;

(d) removing the catalyst;

(e) distilling the reaction mixture to separate polymeric by-products; and

(f) separating the branched chain products from the unbranched chain products.

4,371,470

METHOD FOR MANUFACTURING HIGH QUALITY FATTY ACID ESTERS

Tadsaki Matsukura, Yokohama, and Yukio Nakagawa, Tokyo, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,577

Claims priority, application Japan, Feb. 28, 1980, 55-24335

Int. Cl.³ C11C *3/02*; C09F *5/08*

U.S. Cl. 260—428 **5 Claims**

1. A method for the preparation of a high-quality lower alkyl ester of a fatty acid which comprises the steps of

(a) esterifying a fatty acid glyceride by a first alcoholysis reaction with a lower alcohol in the presence of an alkali catalyst to form a first crude esterification product and glycerine,

(b) separating the glycerine from the first crude esterification product,

(c) esterifying the first crude esterification product by a second alcoholysis reaction with the lower alcohol in the presence of an alkali catalyst to form a second esterification product containing the unreacted lower alcohol and glycerine as dissolved or dispersed therein,

(d) admixing the second crude esterification product with water in an amount from 30% to 150% by weight based on the amount of the lower alcohol contained in the second crude esterification product,

(e) subjecting the second crude esterification product admixed with water to phase separation into the aqueous layer and layer of the lower alkyl ester of fatty acid,

(f) stripping the lower alkyl ester of fatty acid of the water and unreacted lower alcohol contained therein,

(g) admixing the thus stripped lower alkyl ester of fatty acid with from 1 to 10% by weight of an adsorbent to effect decolorization, and

(h) removing the adsorbent from the thus decolorized lower alkyl ester of fatty acid.

4,371,471

HYDROCARBON STOCK SOLUTIONS OF CR^{+6} COMPOUNDS STORAGE-STABILIZED BY A SOLUBLE PARTIAL ESTER OF A PHOSPHORIC ACID

Bruno de Soyres, Mulhouse, and Jacques Nouvel, Tassin la Demi-Lune, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 22, 1980, Ser. No. 171,088

Claims priority, application France, Jul. 26, 1979, 79 19738

Int. Cl.³ C07F *11/00*; B01J *31/12*

U.S. Cl. 260—438.5 R **16 Claims**

1. A composition of matter storage-stabilized against precipitation, comprising a hydrocarbon solvent solution of an organic compound of hexavalent chromium, and including a precipitation stabilizing amount of a partial ester of a phosphoric acid, said partial ester comprising at least one free acid group, O←P—OH, and at least one esterified acid group directly bonded to an acidic phosphorus atom, said esterified acid group being of the formula —OR wherein R is a saturated hydrocarbon radical containing from 1 to 18 carbon atoms, and said partial ester being soluble in said hydrocarbon solvent.

4,371,472

PROCESS FOR PREPARING CYSTEAMINE-S-SUBSTITUTED COMPOUNDS AND DERIVATIVES THEREOF

Tethuharu Okazaki, Sagamihara; Takeo Komukai, Atsugi, and Saburo Uchikuga, Yokohama, all of Japan, assignors to Sogo Pharmaceutical Co. Ltd., Kanagawa, Japan

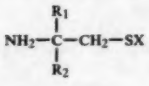
Filed Feb. 3, 1981, Ser. No. 231,113

Claims priority, application Japan, Feb. 4, 1980, 55-011466

Int. Cl.³ C07F *9/02*; C07C *161/05*

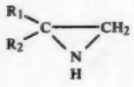
U.S. Cl. 260—453 RY **2 Claims**

1. A process for preparing a cysteamine-S-substituted compound of the formula:



(wherein R_1 and R_2 may be same or different and each represents hydrogen or a lower alkyl group, X is $—SO_3H$, $—PO_3H_2$ or $—PO_3HM$, and M is an alkali metal, ammonium or a ½ alkaline earth metal element),

comprising reacting an ethyleneimine derivative represented by the following formula:



(wherein R_1 and R_2 are as defined above), with a thiosulfate or thiophosphate in the presence of a cation exchanger of the H^+ *form.*

4,371,473

PREPARATION OF 2-(2-FLUORO-4-BIPHENYLYL)PROPIONIC ACID AND CORRESPONDING NITRIDE

Edward J. Zaiko, and Paul F. Ranken, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 53,060, Jun. 28, 1979, Pat. No. 4,278,516. This application Sep. 22, 1980, Ser. No. 189,779

Int. Cl.³ C07C *121/66*, *51/08*

U.S. Cl. 260—465 G **7 Claims**

1. A method for the preparation of 2-(2-fluoro-4-biphenylyl)-propionic acid which comprises

(a) reacting a mixture of 2-amino-4-methylbiphenyl, a fluoridizing agent and a diazotizing agent to form 2-fluoro-4-methylbiphenyl,

(b) reacting said 2-fluoro-4-methylbiphenyl with N-bromosuccinimide or bromide under irradiation with light to form 2-fluoro-4-monobromomethylbiphenyl,

(c) reacting said 2-fluoro-4-monobromomethylbiphenyl with an alkali metal cyanide to form 2-(2-fluoro-4-biphenylyl-)acetonitrile,

(d) reacting a mixture of said acetonitrile, a dialkyl carbonate, an alkali metal alkoxide and an alcohol, and then adding methyl bromide and heating the mixture to form 2-(2-fluoro-4-biphenylyl)propionitrile, and then

(e) reacting a mixture of said propionitrile and an alkali metal hydroxide in an aqueous-organic medium to form 2-(2-fluoro-4-biphenylyl)propionic acid.

4,371,474
HYDROCYANATION OF OLEFINS

Morris Rapoport, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1982, Ser. No. 339,059
Int. Cl.³ C07C *120/02*
U.S. Cl. 260—465.8 R 7 Claims

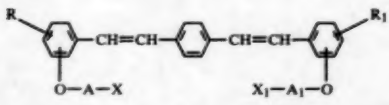
1. A continuous process for the hydrocyanation of non-conjugated, ethylenically unsaturated organic nitriles having 4 to 20 carbon atoms to produce the corresponding dinitriles which process comprises conducting the hydrocyanation in the presence of a zero-valent nickel ligand-containing catalyst having the general formula NiL_4 where L is $P(OAr)_3$ and Ar is an aryl or substituted aryl group having up to 18 carbon atoms promoted with an arylborane, maintaining the temperature of the hydrocyanation at less than about 75° C., controlling the amount of hydrogen cyanide relative to other compounds participating in the reaction such that the overall mol ratio of hydrogen cyanide to unsaturated nitrile is in the range of about 0.18/1 to 0.7/1, the overall mol ratio of hydrogen cyanide to zero-valent nickel catalyst in the range of about 10/1 to 116/1 and the overall mol ratio of hydrogen cyanide to promoter in the range about 30/1 to 400/1 and the molar ratio of total ligand to zero-valent nickel introduced as a catalyst in the range 5.0–7.8.

4,371,475
1,4-BIS-STYRYL-BENZENE DERIVATIVES AND A PROCESS FOR THE PREPARATION OF THE SAME

Takao Yanagisawa, Izumiotsu, and Meguru Tanaka, Sennan, both of Japan, assignors to Showa Kagaku Kogyo Company, Ltd., Japan

Continuation of Ser. No. 793,855, May 4, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,319
Int. Cl.³ C07C *143/42;* D06P *1/38;* C09K *11/06*
U.S. Cl. 260—512 R 12 Claims

1. A 1,4-bis-styryl-benzene derivative of the formula



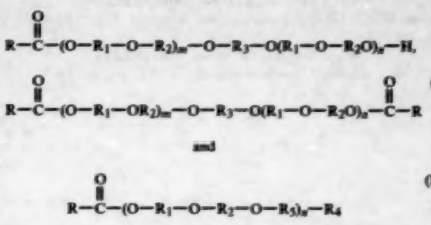
in which R and R_1, which may be same or different, each represent hydrogen atom, halogen atoms, lower alkyl groups or lower alkoxy groups, A and A_1, which may be same or different, each represent lower alkylene groups which may be substituted by halogen atoms, hydroxyl group or lower alkyl groups and X and X_1, which may be same or different, each represent the $-SO_3M$ groups wherein M represents hydrogen atom, an alkali metal, alkaline earth metal, organic ammonium or guanidinium.

4,371,476
MOLD RELEASE AGENTS CONTAINING OXIDATION STABLE POLYOXYALKYLENES

David D. Newkirk, Beaverton, Oreg.; Robert B. Login, Middletown, Pa., and Basil Thir, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 72,616, Sep. 5, 1979, abandoned, which is a division of Ser. No. 973,100, Dec. 26, 1978, Pat. No. 4,217,394. This application Dec. 1, 1980, Ser. No. 211,952
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.³ C08C *00/00*
U.S. Cl. 260—709 13 Claims

1. A composition having internal mold release properties consisting essentially of a polymer suitable for extrusion, injection, or compression molding selected from the group consisting of natural rubber, styrene-butadiene rubber, neoprene rubber, nitrile rubber, polysulfide rubber, cis-1,4-isoprene rubbers, polyurethane polymers, polyesters, polystyrene, polyamides, and polyvinylchloride and a polyoxyalkylene composition comprising a compound selected from the group consisting of:

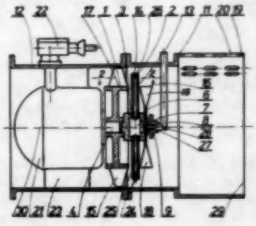


wherein R is individually selected from an alkyl group having 1 to about 21 carbon atoms, n or m+n have a value to produce a molecular weight of about 300 to about 6000, R_1 and R_2 in the formulas (I) and (III) are the same or different and in formula (II), different alkylene or arylene units derived from ethylene oxide, propylene oxide, butylene oxide and an aromatic glycidyl ether, R_3 is derived from a difunctional phenol, R_5 is derived from an aromatic glycidyl ether, and R_4 is hydrogen, an alkyl group derived from an aliphatic monofunctional alcohol having 1 to about 21 carbon atoms or an acyl group derived from an aliphatic monocarboxylic acid having 2 to about 21 carbon atoms.

4,371,477
DUST CONTROL UNIT

Krzysztof Karowiec; Janusz Sedlaczek, both of Gliwice; Alojzy Mura, Mysłowice; Jerzy Pawelczyk, Pyskowice, and Zbigniew Skrzypiec, Katowice, all of Poland, assignors to Centrum Konstrukcyjno-Technologiczne Maszyn Górniczych "Komag", Gliwice, Poland

Filed Dec. 3, 1980, Ser. No. 212,454
Claims priority, application Poland, Jan. 2, 1980, 221153
Int. Cl.³ B01D *47/08*
U.S. Cl. 261—30 6 Claims



1. An apparatus to control dust by wetting dust particles by means of a water mist, comprising in sequence an air fan impeller, a water-charged impeller having a radial duct terminating at the outer periphery thereof, and a further impeller, all said impellers being disposed on a common driving means and common hub means, all of said impellers being disposed in an air tunnel, the water impeller being provided with an outlet water passage situated above the hub means and disposed laterally relative to said radial duct and at an angle α, in a direction toward said further impeller, the angle α being measured in a direction opposite to that of the rotation of the water impeller, said further impeller being a vane impeller, the outer diameter of the vanes of said vane impeller being less than that of the vanes of the air fan impeller, the vanes of the further impeller being disposed at an angle relative to the face of the

water impeller, the disposed angle being substantially the same as the angle α of the outlet passage.

4,371,478

VARIABLE VENTURI CARBURETOR

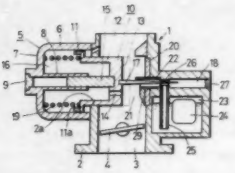
Satomi Wada, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Japan

Filed Jul. 15, 1981, Ser. No. 283,471

Claims priority, application Japan, Jul. 22, 1980, 55-103604[U]

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **2 Claims**



1. In combination with a variable venturi carburetor for an internal combustion engine including a fuel discharging main nozzle arranged in a venturi portion and a suction piston arranged in an opposite side of said main nozzle, said suction piston being reciprocated in response to the variation of negative pressure of air induced to the engine generated at the venturi portion and varying an area of an induction passage of the venturi portion, a variable venturi carburetor comprising a fore-most end of said main nozzle projecting into the venturi portion and a fuel guide member arranged at a lower portion of said fore-most end of said main nozzle for guiding a flow of liquid fuel when the flow rate of air flowing through the venturi portion is low and the liquid fuel is discharged through the main nozzle wherein the width of the upper portion of said fuel guide member is substantially equal to the outer diameter of said main nozzle and the width of the lower portion of said fuel guide member is slightly larger than that of the upper portion thereof and the thickness of said fuel guide member is substantially equal to the lateral projection of the lower portion of said main nozzle at the upper portion thereof and is sequentially reduced from the central portion toward the lower-most end thereof to define a bevel surface.

4,371,479

VARIABLE VENTURI CARBURETOR

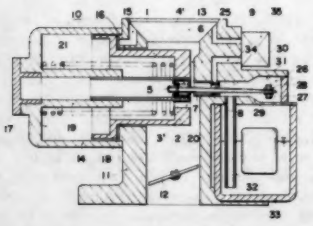
Norihiko Nakamura, and Takashi Kato, both of Mishima, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 23, 1981, Ser. No. 304,914

Claims priority, application Japan, Oct. 7, 1980, 55-139332

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **9 Claims**



1. A variable venturi carburetor comprising: a suction chamber provided to one side of the venturi; a suction piston slidably inserted in the suction chamber; a biasing spring installed in a needle holder provided in the suction piston head; a metering needle held and biased by the biasing spring in the needle holder, the metering needle being loosely inserted through a main nozzle adapted to pass fuel and bleed air provided in the other side of the venturi opposite to the suction piston and through the metering jet adjacent to the main nozzle in such a manner that the needle can be brought into contact with the metering jet; a well into and from which the front end of the metering needle is made to advance or retract, the well having a large-bore portion and a small-bore portion; and an expanded portion formed at the front end of the metering needle, the expanded portion being sized so that it engages with the small-bore portion when the needle is retracted and is loosely contained in the large-bore portion when advanced; whereby during the low air-intake operating condition the metering needle is urged by the biasing spring to press against the metering jet and during the high air-intake operating condition it is floated centered in the metering jet, thus controlling the quantity of bleed air.

4,371,480

PROPELLER FOR DISTRIBUTING A GASEOUS, POWDERED OR LIQUID MATERIAL IN A LIQUID

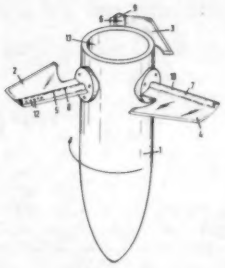
Geert H. Vos, Haren, Netherlands, assignor to Noordvos Schroeven B.V., Groningen, Netherlands

Filed Oct. 16, 1979, Ser. No. 85,215

Claims priority, application Netherlands, Apr. 12, 1978, 7803906

Int. Cl.³ B01F 3/04

U.S. Cl. 261—87 **3 Claims**



1. Apparatus for effecting mixing of material in a body of liquid comprising:

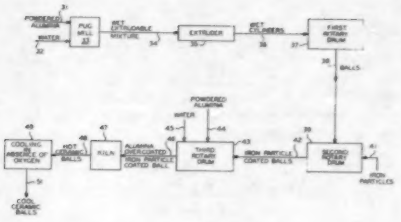
a propeller having a hub and plural blades extending therefrom, each said blade having a tip and a leading edge and a trailing edge,

said blade having immediately rearwardly of said leading edge a relatively thin, solid portion of chord-wise extent, a relatively thick hollow portion rearwardly of the said solid portion of small cord-wise extent and extending substantially to said tip from said hub, the blade lower camber being substantially planar, the blade upper camber being flat substantially from said leading edge and then rising to a line of maximum thickness rearwardly of the leading edge and close to the trailing edge and then falling, the upper camber being curved forwardly and rearwardly of the line of maximum thickness and having thereunder the said hollow portion, the blade having relatively great chord-wise extent forwardly of said hollow portion, and being substantially flat forwardly of said hollow portion, perforations in said blade communicating said hollow portion with the exterior of said blade, said perforations being down stream of the line of maximum thickness and in a line generally parallel to said line of maximum thickness, and passage means in said hub fluid connected with the hollow portion of each said blade.

4,371,481
IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 9,627, Feb. 6, 1979, which is a division of Ser. No. 837,130, Sep. 28, 1977, Pat. No. 4,160,719. This application Nov. 24, 1980, Ser. No. 209,926
Int. Cl.³ B01J 2/00
U.S. Cl. 264—15 3 Claims



1. A process for preparing iron-containing ceramic balls containing about 10 to 90 weight percent iron and the balance a high refractory alumina, which comprises:

admixing finely divided powdered high-refractory alumina of about 5 to 10 micron particle size and sufficient water to form an extrudable wet admixture,

extruding said wet extrudable admixture to provide wet cylinders of about ¼×¼ inch to ½×½ inch,

tumbling said wet cylinders sufficiently to reshape said cylinders to ball-shape, thereby providing first size wet alumina balls of about ¼ to ½" in diameter,

contacting said first size wet alumina balls with iron particles thereby substantially coating said first size wet alumina balls with iron particles,

admixing said iron particle coated first size alumina balls with further water and powdered high-refractory alumina thereby over-coating further high-refractory alumina over said iron particles and forming second size alumina over-coated iron particle-coated alumina balls,

heating the resulting second-size over-coated balls to a temperature of about 2800° F. to 3400° F. for a time sufficient to convert said second-size balls to iron-containing ceramic balls, and

cooling said fired ceramic balls in the substantial absence of molecular oxygen,

wherein said iron-containing ceramic balls contain an inner alumina-core, a shell of iron-particles around said core, and an outer coating of ceramic alumina.

4,371,482
METHOD OF DETERMINING OPTICAL QUALITY OF A SHAPED ARTICLE

Aloysius W. Farabaugh, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 62,832, Aug. 1, 1979, Pat. No. 4,285,745. This application Jan. 16, 1981, Ser. No. 225,585
Int. Cl.³ B29C 17/02; G01N 21/32
U.S. Cl. 264—40.1 9 Claims

1. A method of controlling an article shaping process, wherein the shaping process includes the step of altering physical dimensions of an article, comprising the steps of:

prior to the practice of the altering step, practicing on a selected article the steps of:

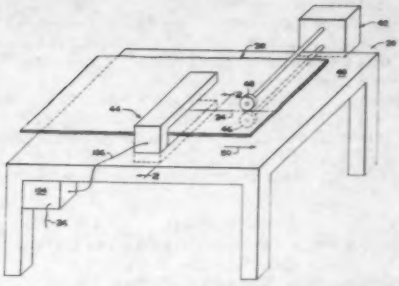
scanning the selected article to generate an optical profile of the selected article, and

altering portions of the optical profile to provide an expected optical profile of the selected article after the practice of the altering step;

practicing the altering step to provide a worked article;

generating an optical profile of the worked article;

comparing the optical profile of the worked article to the expected optical profile of the unworked article to determine differences between the profiles; and

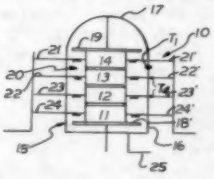


changing the altering step based on the differences determined from said comparing step.

4,371,483
APPARATUS AND PROCESS FOR VULCANIZING, ADJUSTED FOR VARIABLE LOCATION OF POINT OF LEAST CURE

William F. Mattson, Hinckley, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,830
Int. Cl.³ B29H 5/02
U.S. Cl. 264—40.6 21 Claims



1. A method for curing an article from a curable synthetic resinous material in a reusable mold defining a split mold cavity in which a green article of said curable material is to be contacted internally with a heat transfer fluid, and externally by said split mold which is included in a curing means, comprising:

(a) sensing the ambient temperature at which said green article is placed in said mold,

(b) closing said mold, and heating said green article sufficiently to maintain said article at a temperature within a predetermined range of curing temperature until the desired cure of said material is effected,

(c) sensing at least two boundary temperature conditions while said material is being cured, a first of said conditions being determined by temperature external to the body of said article, and a second of said conditions being determined by temperature internal to said body,

(d) continually sensing said first and second boundary conditions during the time period between closure of said curing means and termination of cure,

(e) selecting at least three points along a path within the body of said article, to determine the point of least cure within said article,

(f) repetitively calculating at frequent periodic intervals after closure of said curing means, temperatures along said path

at each one of said three points as a function of time, thermal diffusivity of said material, and the mass and geometry of said tire, so as to track and locate said point of least cure,

(g) computing the number of cure equivalents actually delivered to the point of least cure,

(h) matching the number of cure equivalents computed as having been actually delivered at said point of least cure with a predetermined cure equivalent goal at said point of least cure,

(i) terminating curing of said article when the number of cure equivalents actually delivered at the point of least cure so tracked and located matches the cure equivalent goal, and,

(j) opening said curing means to remove the cured article.

4,371,484

PROCESS FOR MAKING POROUS SINTERED BODY OF CALCIUM PHOSPHATE

Takao Inukai; Yoshiaki Fukuda, and Mikiya Ono, all of Yokoze, Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,970

Claims priority, application Japan, Jun. 13, 1980, 55-78919

Int. Cl.[3] B29H 7/20

U.S. Cl. 264—44 15 Claims

1. A process for making a porous sintered body of calcium phosphate having continuous and fine pores distributed uniformly throughout the porous body, comprising the steps of:

preparing a slurry of amorphous calcium phosphate having a molar ratio of calcium to phosphor ranging within 1.59 to 1.80;

adding a foaming agent to said slurry;

dipping a porous body of an organic material having continuous and fine void channels into said slurry prior to or after foaming said slurry to allow said slurry to adhere on the internal walls of said void channels;

heating said porous body of said organic material at a temperature high enough for decomposing said organic material to varnish into smoke and concurrently for thermally converting said amorphous calcium phosphate into hydroxyapatite to form a network of hydroxyapatite; and

sintering said network of hydroxyapatite to form said porous sintered body.

4,371,485

PROCESS FOR MAKING HYDROPHILIC POLYESTER FIBER

Nikolaus Mathes, Breuberg; Wolfgang Lange, Obernburg, and Klaus Gerlach, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 11, 1980, Ser. No. 215,583

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2755341

Int. Cl.[3] B29D 7/00

U.S. Cl. 264—46.1 14 Claims

1. A process for the production of hydrophilic polyester fibers having a moisture regain of at least about 2% measured at 40° C. and a relative humidity of 92%, comprising

(a) melt spinning a polyester mass comprising a suitable polyester blended with an effective amount of one or more oxalato complexes of the general formula:

$$M_n[Z(C_2O_4)_m],$$

wherein:

M=at least one of the ions Li, Na, K, Rb, or Cs;

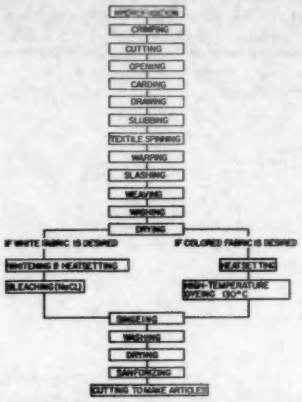
Z=one or more complex-forming central atoms selected from the group Mg, Ca, Sr, Ba, Zr, Hf, Ce, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, B, Al, Ga, In, Sn, Pb, and Sb;

$n \approx 1, \approx 2, \approx 3$ or ≈ 4; and

$m \approx 2, \approx 3, \approx 4$;

sufficient to effect said moisture regain and forming meltspun filaments;

(b) drawing the meltspun filaments; and



(c) hydrosetting said filaments in the presence of an effective amount of liquid water at an effective temperature for an effective time.

4,371,486

METHOD OF FILLING THE CAVITY OF A BUILDING BLOCK WITH AN AMINOPLAST RESIN FOAM INVOLVING REDUCED ADHESION OF THE RESIN TO THE FILLING APPARATUS

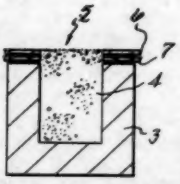
Dennis H. Ogden, Wolverhampton, England, assignor to British Industrial Plastics Limited, Manchester, England

Filed Jun. 12, 1981, Ser. No. 273,188

Claims priority, application United Kingdom, Jun. 20, 1980, 8020189

Int. Cl.[3] B29D 27/04

U.S. Cl. 264—46.6 6 Claims



1. A method of filling a cavity in a building block with aminoplast resin foam, the method comprising the steps of:

(1) locating a template against and in sealing relation to that face of the block having said cavity opening therefrom, so that an aperture defined in said template, whose dimensions are at least as large as the dimensions of the cavity opening in the block which communicates with the cavity, is aligned and registered with said opening, followed by

(2) passing curable aminoplast resin foam into the cavity under pressure to fill said cavity and form an upstand of foam relative to the face of the block in the space defined by the thickness of the template, and then

(3) removing the template to leave at least some of said foam upstand projecting from said face.

4,371,487

PROCESS FOR THE PRODUCTION OF A HOLLOW FIBER SEMIPERMEABLE MEMBRANE

Kaduto Hamada; Zitumi Takata, and Katuhisa Numata, all of Otsu, Japan, assignors to Toyoboseki Kabushiki Kaisha, Osaka, Japan

Filed Oct. 30, 1979, Ser. No. 89,676
Claims priority, application Japan, Feb. 11, 1978, 53/135494
Int. Cl.[3] B29D *27/00*
U.S. Cl. 264—49 5 Claims

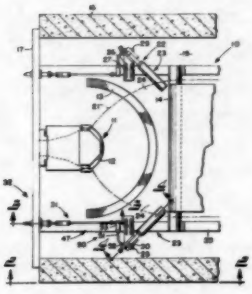
1. A process for the production of a hollow fiber membrane, which comprises forming a spinning solution consisting essentially of cellulose triacetate and an organic acid in N-methyl-2-pyrrolidone having a cellulose triacetate content of 30 to 60% by weight and an organic acid content of 0.02 to 3.0% by weight based on the total weight of the spinning solution, extruding the spinning solution through a spinneret into a gaseous atmosphere, and immersing the resultant spun fiber in an aqueous coagulation bath.

4,371,488

METHOD AND APPARATUS FOR EXTRUDING FOAMED BODIES INVOLVING THE USE OF ADJUSTABLE TRACTION SHAPING ROLLS

Arthur L. Phipps, Tallmadge, and Ben Stoyanov, Akron, both of Ohio, assignors to U.C. Industries, Tallmadge, Ohio

Filed Apr. 2, 1981, Ser. No. 250,266
Int. Cl.[3] B29D *27/00;* B29F *3/01;* B29D *7/24*
U.S. Cl. 264—51 28 Claims



1. A method of controlling and shaping a foaming extrudate exiting from a die orifice, comprising the steps of directing the extrudate through and in engagement with a set of rolls that extend at least substantially across the surfaces of the extrudate on opposite sides thereof, further directing only the opposite edge portions of the extrudate through and in engagement with respective pairs of further rolls downstream of the set of rolls, and adjusting such respective pairs of further rolls for controlled edge forming of the extrudate.

4,371,489

PRODUCTION OF ANTI-STATIC THERMOPLASTICS FILMS

Patrick T. McGrail, Hitchin, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 15, 1980, Ser. No. 197,239
Claims priority, application United Kingdom, Oct. 19, 1979, 7936427; Feb. 1, 1980, 8003460
Int. Cl.[3] B29D *7/02, 7/24*
U.S. Cl. 264—129 6 Claims

1. A process for the production of a molecularly oriented thermoplastics film having an antistatic coating layer which comprises melt extruding a self-supporting thermoplastics film, molecularly orienting the extruded film by stretching in at least one direction and applying a coating layer to at least one side of the film before the commencement of or during the molecular orientation, wherein the coating layer is applied from a film-forming composition comprising:

(i) a copolymer comprising as its major component comonomeric units of one or more alkyl esters of acrylic and methacrylic acids which is cross-linkable by means of cross-linking functional groups contained in the copolymer;

(ii) a cross-linking agent for the copolymer selected from the class consisting of condensation products of amines with aldehydes; and

(iii) an aqueous solution of at least one partially neutralized acidic phosphate ester, the phosphate ester being chosen from compounds of the following structure:

wherein

R represents an unreactive hydrocarbon radical optionally containing unreactive substituents and having a total of not more than 10 carbon atoms;

R^1 represents an unreactive hydrocarbon radical optionally containing unreactive substituents and having a total of not more than 10 carbon atoms or is sodium or potassium, ammonium, an amine cation or hydrogen;

M is sodium or potassium, ammonium, an amine cation, or hydrogen; wherein said aqueous solution of said phosphate ester, prior to its addition to the components of the composition which cross-link, has been prepared by partially neutralizing the corresponding acidic phosphate ester with potassium hydroxide or sodium hydroxide in an aqueous medium to a pH of 1.7 to 5 and then rendering the partially neutralized ester alkaline to a pH in the range of 7.5 to 10 by treatment with a volatile base, said volatile base being volatile at the temperature prevailing during the stretching and/or heat-setting steps which follow the application of the film-forming composition, and the amount of phosphate ester in the film-forming composition is in the range 12.5 to 100% by weight expressed as the weight of the corresponding unneutralised acid phosphate ester and based on the solids content of the rest of the composition.

4,371,490

CHEESE MOULD AND/OR FOLLOWER WITH ROUGHENED INNER SURFACE AND METHOD FOR MAKING SAME

Bernard T. Geessink, Frans Halslaan 5, Musselkanaal, Netherlands

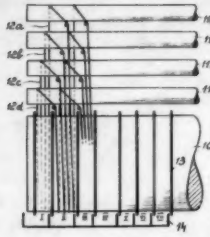
Filed Feb. 18, 1981, Ser. No. 235,603
Claims priority, application Netherlands, Feb. 20, 1980, 8001029
Int. Cl.[3] A23C *19/05;* B29C *17/12, 25/00*
U.S. Cl. 264—162 12 Claims

1. Cheese mould provided with a wall of plastic material with fine holes for draining away the whey and a roughened non-smooth inner surface provided with a regular pattern of grooves, and superimposed upon this pattern, fine scratches in an irregular pattern.

4,371,491
PROCESS FOR THE CONTINUOUS SPINNING OF VISCOSE RAYON

Tommaso Benai, Rieti; Novello Leoncini, Limbiate, and Ugo Paoletti, Monza, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Jan. 9, 1981, Ser. No. 223,926
Claims priority, application Italy, Jan. 9, 1980, 19109 A/80
Int. Cl.³ D01F *2/06*
U.S. Cl. 264—196 4 Claims

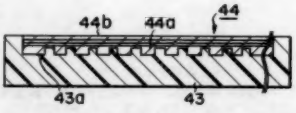


1. In a process for the continuous spinning of viscose rayon comprising continuously carrying out the steps of: coagulating and drawing the rayon yarn, and setting the yarn, the improvement which consists essentially of subjecting the yarn to a first setting treatment at 65° to 85° C. with a first aqueous bath containing from 30 to 70 g/l of H_2SO_4, 60 to 140 g/l of Na_2SO_4 and from 1.8 to 4.2 g/l of $ZnSO_4$; thereafter subjecting the yarn to a second setting treatment at 50° to 70° C. with a second aqueous bath containing from 15 to 35 g/l of H_2SO_4, 30 to 70 g/l of Na_2SO_4 and from 0.9 to 2.1 g/l of $ZnSO_4$, and washing the yarn, all of said steps being carried out continuously said second setting treatment being at a lower temperature and acidity than the first setting treatment such that the sulphurous salts in the yarn are substantially eliminated by the combined first and second setting treatments.

4,371,492
METHOD OF MANUFACTURING ELECTRODE SUPPORTING BASE PLATE FOR RADIATION DETECTOR

Moriyoshi Murata, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 15, 1981, Ser. No. 302,698
Claims priority, application Japan, Sep. 17, 1980, 55/128848
Int. Cl.³ B29C *1/02*
U.S. Cl. 264—226 7 Claims



1. A method for manufacturing an electrode supporting base plate for a radiation detector for alternately arranging a plurality of high voltage electrodes and signal detecting electrodes, respectively, comprising the steps of:

preparing a master of said base plate by processing with high precision a material having a small thermal expansion coefficient;

transferring a pattern of said master to an elastic molding material to prepare an elastic transfer mold; and

injecting a resin in said transfer mold, curing the resin, and removing said electrode supporting base plate from said transfer mold.

4,371,493
METHOD OF MAKING BOUNCING SILICONE PUTTY-LIKE COMPOSITIONS

Maurice A. Minuto, 15 Hemingway Dr., Dixhill, N.Y. 11746

Filed Sep. 2, 1980, Ser. No. 183,466
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—236 4 Claims

1. A method of making bouncing silicone putty-like substance which comprises:

(a) mixing a vulcanizable silicone polymer with a boron compound and a reinforcing filler and making a sheet stock of the resulting mixture,

(b) placing said sheet stock in an oven containing at least one perforated tray and cooking the sheet stock at a temperature of from about 350° F. to about 500° F. for several hours,

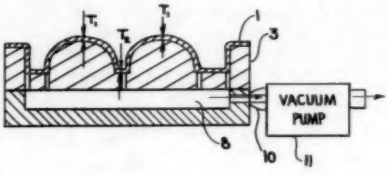
(c) removing the volatiles produced during the cooking operation described in step (b) from said oven by passing air through said perforated tray, and

(d) cooling the sheet stock.

4,371,494
METHOD FOR MANUFACTURING A THERMOPLASTIC CYLINDRICAL CLAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Incorporated, Pasadena, Calif.

Filed Nov. 3, 1980, Ser. No. 203,336
Int. Cl.³ B29C *17/04*
U.S. Cl. 264—522 4 Claims



1. A method for manufacturing a thermoplastic open ended cylindrical clamp including the following steps:

heating a flat sheet of thermoplastic material to its softening point;

providing a mold having two semicylindrical shapes in a parallel relationship with a narrow planar surface therebetween and a coplanar flange surrounding the semicylinders, said planar surface being sufficiently narrow that plastic thermoformed over the mold will be locally stretch-thinned at said planar surface to a thickness no greater than 60% of the original sheet thickness;

thermoforming the softened plastic sheet over the mold thereby forming a pair of spaced apart semicylindrical portions connected together by a thinned planar portion positioned therebetween and each having an extreme flange along one side thereof;

trimming the sheet to a form wherein the semicylindrical portions are open at each end;

applying sufficient localized heat to the planar portion between the semicylindrical portions to re-soften the plastic;

bending the locally re-softened planar portion approximately 180° so the extreme flanges along one side of semicylindrical portion are juxtaposed as the semicylindrical portions form a complete cylinder; and

cooling the plastic part in the cylindrical shape suitable for clamping a generally cylindrical object therein,

said trimming step including trimming each said extreme flange in the shape of a hook so configured as to permit suspension of the clamp and an object clamped therein from a bar,

said thermoforming step including thermoforming a stiffen-

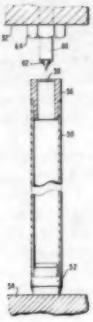
ing rib as a projection from each semicylindrical portion substantially through the length of the portion of the juxtaposed flange to be trimmed in the shape of a hook.

4,371,495

SELF RUPTURING GAS MODERATOR ROD FOR A NUCLEAR REACTOR

George R. Marlatt, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1981, Ser. No. 228,007
Int. Cl.[3] G21C 7/26
U.S. Cl. 376—209 4 Claims



1. A nuclear reactor comprising:

a plurality of fuel assemblies, each of said assemblies having top and bottom nozzles with fuel rods and control rod guide tubes interposed therebetween;

at least one gas-filled tube in a portion of said assemblies, said tube extending substantially the full length of said assembly having its bottom end resting on the upper surface of said lower nozzle;

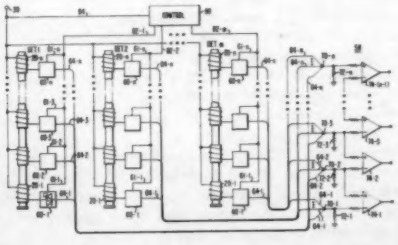
a spike immovably mounted in the lower plate of the top nozzle and having its point directed downwardly toward the top of said gas-filled tube, the point on said spike and top of said rod being spaced a distance equal to the amount the rod will expand during operation in a reactor, minus a distance sufficient for the spike to pierce the top of said tube and permit the gas therein to be displaced by water coolant circulating through the reactor.

4,371,496

POSITION INDICATION SYSTEM

Charles A. Lawson, II, Linthicum Heights, Md., and Wayne L. Dufek, Stewartstown, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 18, 1980, Ser. No. 160,528
Int. Cl.[3] G21C 17/00; G01R 33/00
U.S. Cl. 376—258 5 Claims



1. A position detection system for a plurality of longitudinally movable members each movable within respective housings between first and second limits, comprising:

(a) a plurality of detectors each having at least a first group of coils disposed along the path of movement of a respective movable member, each said coil experiencing a change of impedance when in proximity to said member;

(b) each said coil having first and second ends;

(c) means for connecting the first ends of all of said coils to a source of AC signal;

(d) a plurality of differential amplifiers each having first and second inputs;

(e) means connecting adjacent ones of said coils of each said detector to first and second respective inputs of a respective differential amplifier of said above plurality;

(f) said connecting means including a plurality of sets of bilateral switches, each set connected to the second ends of respective coils of a detector with each switch having input means for receiving a control signal to enable bilateral conduction of said switch;

(g) control means for supplying said control signal to individual sets of said switches, in sequence.

4,371,497

INHIBITION OF CORROSION WITH THIAZINE QUATERNARY AMMONIUM SALTS OF POLYEPIHALOPHYDRIN

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 32,036, Apr. 23, 1979, Pat. No. 4,316,007. This application Jun. 9, 1981, Ser. No. 271,896
Int. Cl.[3] C08G 59/50; C23F 11/04
U.S. Cl. 422—12 12 Claims

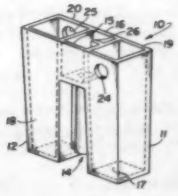
1. A process of inhibiting corrosion of metal in contact with a corrosive medium which comprises adding to said corrosive medium a corrosion-inhibiting amount of a thiazine quaternary salt of polyepihalohydrin wherein the nitrogen atom of the thiazine moiety is attached to the polymeric chain through a $—CH_2—$ group.

4,371,498

CODED CUVETTE FOR USE IN TESTING APPARATUS

Richard E. Scordato, Scarsdale, N.Y., and Robert J. Varca, Fort Lee, N.J., assignors to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,419
Int. Cl.[3] G01N 35/00; B01L 3/00
U.S. Cl. 422—102 7 Claims



1. A dual cuvette adapted for use in a photometric blood testing apparatus, said cuvette comprising a pair of spaced apart flat sided sample receptacles, connecting means for joining the pair of receptacles to form an integral dual cuvette, said connecting means having a pair of opposite side walls coplanar with the sidewalls of said cuvette receptacles and extending from the top edge of said receptacles downwardly a distance less than the height of a cuvette receptacle and a bottom wall joining the bottom edges of said sidewalls, with a cylindrically shaped locating member depending from said bottom wall and centrally positioned between said pair of sample receptacles by which the cuvette can be mechanically positioned and secured

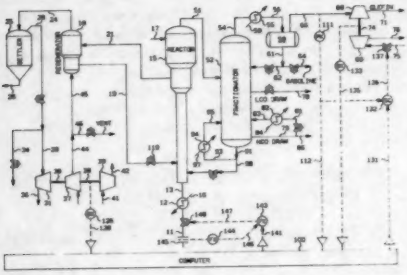
in the testing station of the blood testing apparatus, and machine readable code means being provided on at least one side wall of the cuvette to enable the testing apparatus to sense the code and determine the reagent to be added to and the test to be performed on samples contained in the cuvette receptacles.

4,371,499

CONTROL OF A FLUID CATALYTIC CRACKING UNIT

William B. Bard; John O. Walters, both of Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1981, Ser. No. 258,974
Int. Cl.³ C10G *11/18;* **G05D** *7/00;* **F27B** *15/00*
U.S. Cl. 422—111 **20 Claims**



1. Apparatus comprising:
a reactor;
a catalyst regenerator;
a fractionator;
means for supplying a feed to said reactor;
means for supplying a regenerated cracking catalyst from said catalyst regenerator to said reactor;
means for removing cracking catalyst contaminated by carbon from said reactor and for supplying the thus removed cracking catalyst to said catalyst regenerator;
air blower means for supplying a free oxygen-containing gas to said regenerator;
means for removing hot flue gases from said catalyst regenerator;
means for removing the products produced by the cracking of said feed from said reactor and for supplying the thus removed products as a feed to said fractionator;
cooling means;
accumulator means;
means for withdrawing an overhead stream from said fractionator and for supplying the thus withdrawn overhead stream through said cooling means to said accumulator means;
a compressor;
means for withdrawing uncondensed vapors from said accumulator means and for supplying the thus withdrawn uncondensed vapors to the suction inlet of said compressor;
means for establishing a first signal representative of the actual speed of said air blower means;
means for establishing a second signal representative of the highest desired speed for said air blower means;
means for comparing said first signal and said second signal and for establishing a third signal which is representative of a first desired suction pressure for said compressor;
means for manipulating the speed of said compressor in response to said third signal;
means for establishing a fourth signal representative of the actual speed of said compressor;
means for establishing a fifth signal representative of the highest desired speed for said compressor;
means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is representative of a first feed flow rate; and
means for manipulating the flow of feed to said reactor in response to said sixth signal.

11. A method for controlling a fluid catalytic cracking unit, wherein a feed provided to a reactor is contacted with a regenerated cracking catalyst provided to the reactor from a catalyst regenerator to produce a product stream which is provided from said reactor to a fractionator, wherein cracking catalyst contaminated by carbon is provided from said reactor to said catalyst regenerator and contacted with a free oxygen-containing gas provided to said catalyst regenerator from an air blower to produce said regenerated catalyst with the resulting hot gases being removed from said catalyst regenerator as a flue gas, and wherein an overhead stream is withdrawn from said fractionator and partially condensed with the uncondensed portion of said overhead stream being provided to the suction inlet of a compressor, said method comprising the steps of:
selecting said air blower for base loading;
establishing a first signal representative of the actual speed of said air blower;
establishing a second signal representative of the highest desired speed for said air blower;
comparing said first signal and said second signal and establishing a third signal which is representative of a first desired suction pressure for said compressor;
manipulating the speed of said compressor in response to said third signal;
establishing a fourth signal representative of the actual speed of said compressor;
establishing a fifth signal representative of the highest desired speed for said compressor;
comparing said fourth signal and said fifth signal and establishing a sixth signal which is representative of a first feed flow rate; and
manipulating the flow of feed to said reactor in response to said sixth signal.

4,371,500

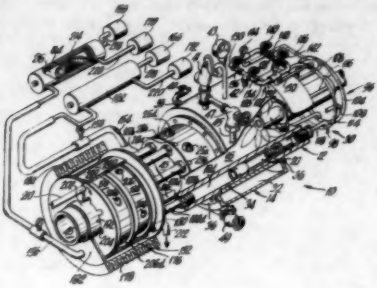
APPARATUS FOR GENERATING HYDROGEN

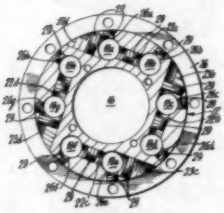
Ronald I. Papineau, Goshen, Mass., assignor to Unique Energy Systems, Inc., Holyoke, Mass.

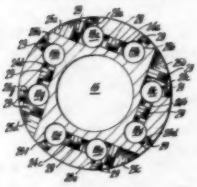
Continuation of Ser. No. 921,000, Jun. 30, 1979, abandoned.
This application Aug. 5, 1980, Ser. No. 175,597
Int. Cl.³ B01J *8/06;* **C01B** *3/08, 3/10*
U.S. Cl. 422—115 **18 Claims**

1. A hydrogen generator comprising:
a reactor including a plurality of longitudinal parallel tubes;
porous material supported within each of said tubes, for providing hydrogen from water;
means operatively connected to said reactor for providing heat to said tubes to elevate the temperatures thereof for the generation of the hydrogen;
means connected to said reactor for supplying water at elevated temperatures to said tubes, wherein, at the elevated temperatures and in the presence of said porous material, hydrogen is generated;
said porous material being positioned in said tubes to permit the hydrogen to diffuse therethrough, the pores of said material being sufficiently small to inhibit passage of water for separating the hydrogen from other products of the disassociation of the water; and
transverse and radial passages at each end of said tubes which connect said longitudinal tubes to each other, to atmosphere and to said water supply means, said passages

including means adapted to receive closures therein so as to provide for selective closing and/or communication







therebetween, thereby providing a reactor of optimum operational flexibility.

4,371,501

FLUID CATALYST REGENERATION APPARATUS

Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 118,372, Feb. 4, 1980, Pat. No. 4,309,308, which is a continuation-in-part of Ser. No. 969,607, Dec. 14, 1978, Pat. No. 4,219,442. This application Sep. 17, 1981, Ser. No. 303,256

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.[3] **F27B** *15/08;* **B01J** *21/20, 29/38;* **C10G** *11/18*

U.S. Cl. 422—142 **2 Claims**

1. An apparatus for regenerating a coke-contaminated, fluid catalyst which apparatus comprises in combination:

(a) a vertically oriented combustion chamber;

(b) a spent catalyst inlet conduit for gas and fluid catalyst connecting with the lower portion of said combustion chamber;

(c) fluid catalyst collecting means disposed within an upper portion of said combustion chamber;

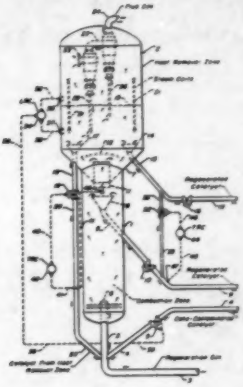
(d) a first catalyst withdrawal conduit, connecting with said catalyst collecting means, for withdrawal of collected regenerated fluid catalysts from said combustion chamber;

(e) a heat removal chamber located super adjacent to said combustion chamber and in communication therewith;

(f) heat removal means disposed within said heat removal chamber;

(g) a second catalyst withdrawal conduit connected at one end to said heat removal chamber for withdrawing regenerated fluid catalyst from said heat removal chamber; and

(h) a mixing conduit connected at one end to said second withdrawal conduit and at the other end to said first withdrawal conduit, such that regenerated fluid catalyst from said heat removal chamber can pass into said first withdrawal conduit, and (i) a control system for said



apparatus comprising means to sense the catalyst temperature in said first withdrawal conduit at a locus downstream of the locus where said mixing conduit connects to said first withdrawal conduit, temperature control means having an adjustable set point connecting with said temperature sensing means and developing an output signal, flow control means regulating the rate of flow of regenerated catalyst through said mixing conduit, and means for transmitting said output signal to said flow control means whereby the latter is adjusted responsive to said catalyst temperature.

4,371,502

CRYSTAL GROWING FURNACE PULLING HEAD

Clifton B. Sibley, Needham, and Robert P. Bell, Wellesly, both of Mass., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 119,913, Feb. 8, 1980, abandoned. This application Mar. 30, 1981, Ser. No. 249,196

Int. Cl.[3] **C30B** *15/32*

U.S. Cl. 422—249 **14 Claims**

10. A Czochralski-type crystal-growing furnace apparatus for drawing a crystal from a melt, which apparatus comprises:

(a) crucible means for containing a melt from which a crystal is to be drawn;

(b) pulling-head means for drawing a crystal along a vertical axis from the melt in the crucible means;

(c) means to provide relative rotation about the vertical axis between the melt and the crystal drawn therefrom;

(d) seed-holder means for securing a seeded crystal drawn from the melt;

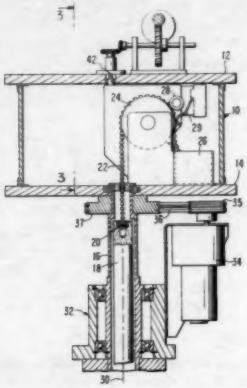
(e) chain means having a plurality of flexibly coupled links comprising a plurality of connected, generally uniform, spherical bead elements, the chain means having a one end and another free end, the chain means secured at the one end to the seed-holder means and adapted to move the seed-holder means along the vertical axis;

(f) a chamber means surrounding the crucible means and the pulling-head means, to maintain a hermetically sealed

environment for the drawing of a seeded crystal from the melt; and

(g) take-up means in cooperative engagement with the chain means, to move the seed-holder means and the seeded crystal grasped thereby along the vertical axis, which take-up means includes

(i) sprocket means which comprises a driven cylinder including teeth spaced along the periphery and having a plurality of shaped pockets on the peripheral surface of the means, which shaped pockets of the teeth conform to the general shape of and are adapted to engage cooperatively at least a portion of the flexibly coupled links of the chain means, an intermediate portion of the chain means between the one and the other free end passing



over the surface of the sprocket means and the flexibly coupled links in a cooperative tensioned engagement with the pockets on the surface, said sprocket means disposed to align a vertically oriented tangent from said sprocket means congruent with said vertical axis,

(ii) means to rotate the sprocket means to move the chain means, so that the seed holder will move along a vertical axis, and

(iii) containment means, which comprises a portion of the interior volume of said chamber means, to receive or discharge the free, untensioned other end of the chain means, as the sprocket means drives the chain means along the vertical axis, raising or lowering the seed holder.

4,371,503

APPARATUS FOR THE VAPORIZATION OF ALUMINUM TRICHLORIDE

Dietmar Aichelmann, Hermann-Steinegger-Strasse 77; Karl Kannenberg, Friedrich-Ebert-Strasse 8; Dieter Schutte, Ernst-Reuter-Strasse 16, all of 7888 Rheinfelden, and Axel Volling, Stettiner Strasse 2, 5040 Bruhl, all of Fed. Rep. of Germany

Continuation of Ser. No. 167,156, Jul. 8, 1980, abandoned. This application Oct. 9, 1981, Ser. No. 310,415

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1979, 2928805

Int. Cl.³ B01D *1/02*

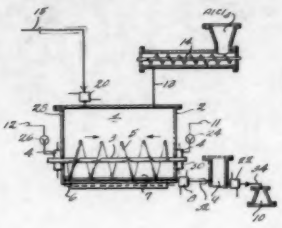
U.S. Cl. 422—307 **3 Claims**

1. An apparatus for the vaporization of aluminum trichloride comprising an enclosed curved trough in the shape of an U, having a pair of flat front curved surfaces, means for introducing a meltable mixture containing aluminum chloride into the trough and means for removing vaporized aluminum chloride from the upper portion of the trough,

rotatably disposed at the midpoint of the curve of said front surfaces a shaft aligned parallel to the horizontal longitudinal axis of the trough, said shaft including nitrogen gas sealing means for said shaft to prevent escape of aluminum chloride,

disposed on said shaft a helical stirrer having two equal but oppositely directed pitches,

disposed on the curve of the trough parallel to the horizontal



longitudinal axis of the trough outside of the wall thereof at least two heating rods along the entire length of the trough, and

disposed at one end of the trough at the lowest point of said curve a means for the continuous discharge of melted material.

4,371,504

EXTRACTANT AND PROCESS FOR EXTRACTING URANIUM WET-PROCESS PHOSPHORIC ACID

William M. Leaders, Lakeland, Fla., and Charles D. Harrington, Pasco, Wash., assignors to Uranium Recovery Corporation, Mulberry, Fla.

Continuation of Ser. No. 772,818, Feb. 28, 1977, abandoned. This application Oct. 25, 1979, Ser. No. 88,152

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **15 Claims**

1. In a process for extracting tetravalent uranium from wet-process phosphoric acid containing ferric iron with an extractant comprising a solution of a mixture of mono- and di-(alkylphenyl) esters of orthophosphoric acid in an inert diluent in which said ferric iron contained in the wet-process phosphoric acid combines with the mixed esters to form a precipitate, the improvement comprising modifying the process by adding to the extractant an essentially water-immiscible phenol in a concentration sufficient to substantially prevent formation of said precipitate.

4,371,505

PROCESS FOR THE RECOVERY OF URANIUM CONTAINED IN AN IMPURE PHOSPHORIC ACID

Jean-Marc Pautrot, Neuilly sur Seine, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 28, 1980, Ser. No. 125,575

Claims priority, application France, Feb. 28, 1979, 79/05155

Int. Cl.³ C01G *43/00*

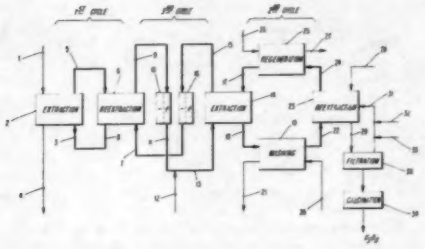
U.S. Cl. 423—10 **36 Claims**

1. In a continuous process for the recovery of uranium (VI) contained in an impure phosphoric acid comprising:

(a) a first cycle comprising (i) extracting an impure phosphoric acid with an organic phase which extracts uranium (VI) without extracting substantial amounts of uranium (IV), followed by separating the phases; (ii) extracting the resultant organic phase charged with uranium (VI) with an aqueous solution containing an oxidizing-reducing agent in the reduced state, said oxidizing-reducing agent being a reducing agent for uranium (VI) to uranium (IV) in said aqueous solution and comprising iron (II) ions, said aqueous solution being a solution of phosphoric acid and the phosphoric acid concentration of said aqueous solution being between about 18% and about 70% by weight

of P_2O_5, followed by separating the phases; (iii) recycling the resultant organic phase depleted of uranium to the extracting of the impure phosphoric acid; and (iv) treating the resultant aqueous solution charged with uranium (IV), to oxidize the uranium (IV) to uranium (VI) and to convert the oxidizing-reducing agent to its oxidized state; and

(b) a second cycle comprising (i) extracting the oxidized aqueous solution resulting from the first cycle with an organic phase which extracts uranium (VI), followed by separating the phases; (ii) washing the resultant organic phase charged with uranium (VI) with a phosphoric acid solution free of iron, the concentration of the phosphoric acid in the washing solution being close to that of the aqueous extracting solution employed in step (ii) of the first cycle, followed by separating the resultant purified organic phase, treating said purified organic phase with an aqueous solution containing carbonate and ammonium ions to precipitate the uranium in said solution in the form of ammonium uranyl tricarbonate, separating the depleted organic phase from the aqueous suspension and recovering the uranium from said aqueous suspension in the form of ammonium uranyl tricarbonate; and (iii) regenerating



and then recycling the resultant organic phase depleted of uranium to the second cycle extracting step; the improvement comprising:

(i) carrying out step (iv) of the first cycle by treating the aqueous solution charged with uranium (IV) resulting from the extracting step (ii) of the first cycle in its entirety in the anodic compartment of an electrolytic cell under direct current voltage;

(ii) carrying out step (i) of the second cycle by treating the oxidized aqueous phase issuing from and anodic compartment with the organic extracting phase of the second cycle;

(iii) treating the resultant aqueous phase depleted of uranium in its entirety in the cathodic compartment of said electrolytic separation cell under direct current voltage, to afford an aqueous phase containing the oxidizing-reducing agent in the reduced state; and

(iv) recycling the resultant aqueous phase to the back extracting step of the first cycle;

whereby the aqueous solution is circulated in a closed loop between the first and second cycles, in the form of a third cycle.

4,371,506

AMMONIACAL ELUTION OF COPPER FROM ION EXCHANGE RESINS

Eduard Byleveld, Richmond Hill, Canada, assignor to Himsley Engineering Limited, Toronto, Canada

Filed Jun. 18, 1981, Ser. No. 274,865
Int. Cl.³ C01G 3/14
U.S. Cl. 423—24 **24 Claims**

1. Method for the successive elution of cupric ion-loaded beds of chelating anion exchange resin, to recover an eluate of relatively high copper concentration, said resin being characterised by having pendent aminopyridine groups, comprising subjecting each bed to an elution cycle comprising

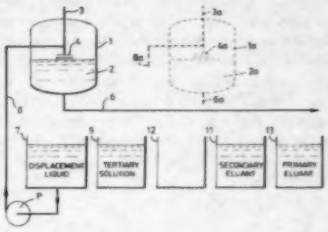
(a) contacting the bed with a tertiary ammoniacal solution of relatively low copper concentration obtained as effluent solution from step (f) of the preceding elution cycle;

(b) withdrawing a first effluent solution from the bed;

(c) removing said first effluent solution from the system;

(d) contacting the bed with a secondary ammoniacal eluant solution of intermediate copper concentration obtained as effluent from step (k) of the preceding elution cycle;

(e) withdrawing from the bed first and second fractions of a second effluent solution, said fractions having relatively low and relatively high copper concentrations, respectively;



(f) collecting the first fraction of said effluent solution for use as tertiary solution in step (a) of the next elution cycle;

(g) recovering said second fraction;

(h) contacting the bed with a primary ammoniacal eluant solution substantially free of copper ions;

(i) withdrawing from the bed first and second fractions of effluent solution having relatively high and intermediate copper concentrations, respectively;

(j) recovering said first fraction;

(k) collecting said second fraction for use as secondary eluant in step (d) of the next elution cycle;

(l) providing a bed of cupric ion-loaded chelating anion exchange resin; and

(m) re-commencing said elution cycle by repeating steps (a) to (l).

4,371,507

CATALYTIC HYDROGENATION OF OLEFINS, HYDRODESULFURIZATION OF ORGANIC SULFUR COMPOUNDS AND/OR SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM FLUID STREAMS

Floyd E. Farha, Jr., and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 190,004, Sep. 23, 1980, Pat. No. 4,313,820, which is a continuation-in-part of Ser. No. 125,438, Feb. 28, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,964
Int. Cl.³ B01D 53/34
U.S. Cl. 423—230 **36 Claims**

1. A process for removing hydrogen sulfide from a fluid stream comprising the step of contacting said fluid stream under suitable absorbing conditions with an incompletely sulfided absorbing composition comprising zinc titanate and at least one promoter selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel, molybdenum, rhenium, and compounds thereof, wherein the concentration by weight of said at least one promoter in said absorbing composition is less than the total concentration by weight of said zinc titanate in said absorbing composition.

4,371,508
METHOD FOR OPERATING A FLUE GAS DESULFURIZATION

Klaus Weinzierl, and Robert Karger, both of Dortmund, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 200,973

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943468

Int. Cl.³ C04B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A method of operating with the suspension existing after a flue gas desulfurization in connection with a steam power plant fired with fossil fuels, said method including the steps of:

removing the sulfur dioxide contained in said flue gas by means of an excess of one of the group consisting of milk of lime and limestone to produce calcium sulfite and to leave non-converted excess in the suspension;

oxidizing said produced calcium sulfite with air at a low pH-value to calcium sulfate; and;

at least partially neutralizing said non-converted excess by addition of at least one of the group consisting of the acid waste water from a complete desalination plant for feed water, and the acid condensate from the flue of said steam power plant.

4,371,509
OXIDIZING PHOSPHORUS COMPOUNDS WITH CHLOROSULFONIC ACID

Jürgen Grosse, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,678

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033957

Int. Cl.³ C07F *9/09, 9/42, 9/28*; C01B *25/10*

U.S. Cl. 423—300 **3 Claims**

1. A process for oxidizing phosphorus compounds of the general formula (I)

$$R_{3-n}PX_n \quad (I)$$

in which R stands either for rectilinear and/or branched alkyl-, cycloalkyl-, aryl-, alkylaryl- as well as aralkyl groups having from 1 to 18 carbon atoms, or for a group —OR' or —SR', in which R' stands for an aryl radical or alkyl radical having from 1 to 8 carbon atoms, or two R groups together stands for a group

in which R" stands for an alkylene radical having from 2 to 8 carbon atoms, X stands for halogen, and n stands for 0, 1, 2 or 3, so as to obtain compounds of the following general formula (II)

$$R_{3-n}P(O)X_n \quad (II)$$

in which R, X and n have the meanings given above, which comprises using chlorosulfonic acid as an oxidant and effecting the oxidation in homogeneous liquid phase.

4,371,510
PROCESS FOR THE CONTINUOUS CRYSTALLIZATION OF ZEOLITIC SODIUM ALUMINOSILICATES OF SMALLEST PARTICLE SIZE

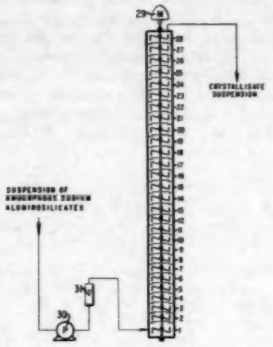
Peter Christophliemk, Düsseldorf; Willi Wüst, Ratingen-Hösel, and Franz-Josef Carduck, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Duesseldorf-Holthausen and Degussa Aktiengesellschaft (Henkel KGaA), Frankfurt, both of, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,483

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941636

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **9 Claims**



1. In a process for the production of an aqueous suspension of low-grit, crystallized zeolitic sodium aluminosilicate of the smallest particle size having the composition

$$0.9 \text{ to } 1.1\ Na_2O \cdot 1\ Al_2O_3 \cdot 1.8 \text{ to } 2.5\ SiO_2$$

with a water content depending on the degree of drying, which contains at least 99.8% by weight of a particle size of less than 25 μm and has a high cation exchange capability, comprising crystallization of an aqueous alkaline suspension of an x-ray-amorphous sodium aluminosilicate, said suspension having a composition corresponding to the molar ratios of

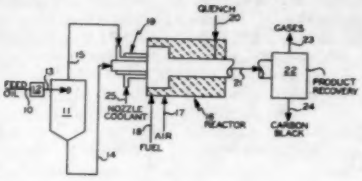
$$1.5 \text{ to } 5\ Na_2O\text{: } 1\ Al_2O_3\text{: } 1 \text{ to } 4\ SiO_2\text{: } 40 \text{ to } 400\ H_2O$$

at elevated temperatures and recovering crystallized zeolitic sodium aluminosilicate, the improvement consisting of feeding the suspension of the x-ray-amorphous sodium aluminosilicate continuously into a crystallizing reactor having progressively, separately zoned mixing areas with a stage-like effect and having at least 20 stages, wherein the suspension flows first through at least 8 stages in the intake part of the reactor, which intake part of the reactor may comprise up to one third of the total reactor volume, maintaining said suspension in the reactor at a preselected temperature in the range of from 80° C. to 100° C. until the degree of crystallization of the zeolitic sodium aluminosilicate, determined by x-ray, has reached at least 80% of the theoretically possible crystallinity, and continuously removing the suspension from the end opposite of the intake end of the reactor where said suspension of the x-ray-amorphous sodium aluminosilicate is continuously fed into said crystallizing reactor and continuously removed at a throughput in the range of from 1 to 4 cubic meters of suspension per cubic meter of reactor volume and per hour, and said suspension of the x-ray-amorphous sodium aluminosilicate is below said preselected crystallization temperature and is heated by steam injection to said preselected crystallization temperature before it leaves said intake part of the reactor.

4,371,511
DECREASING CARBON BLACK REACTOR FOULING RATE

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 9, 1981, Ser. No. 281,754
Int. Cl.[3] C01B 31/02; C09C 1/48
U.S. Cl. 423—456 8 Claims



1. A process for producing carbon black wherein in a reactor a carbon black forming feed is heated by hot combustion gases to form carbon black,

said process comprising:

(a) feeding a contaminant enriched carbon black forming feed stream into said reactor,

(b) feeding a substantially contaminant free carbon black forming feed stream into said reactor coaxially to and surrounding said contaminant enriched carbon black forming feed stream,

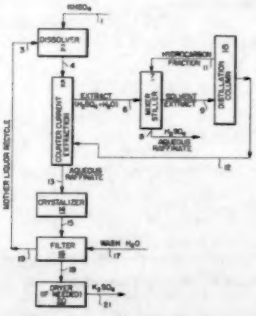
(c) heating the contaminant enriched stream and substantially contaminant free carbon black forming feed stream with hot combustion gases to subject these streams to carbon black forming temperatures thereby producing carbon black, and

(d) recovering the carbon black produced.

4,371,512
PRODUCTION OF ALKALI METAL SULFATES

John B. Sardisco, Shreveport, La., and Erhart K. Drechsel, Montgomery, Tex., assignors to Pennzoil Company, Houston, Tex.

Filed Feb. 3, 1981, Ser. No. 231,361
Int. Cl.[3] C01D 15/06; C22B 26/10; C01B 17/74
U.S. Cl. 423—551 12 Claims



1. A process for the production of an alkali metal sulfate from an alkali metal hydrogen sulfate which comprises the steps of:

(a) forming an aqueous solution of an alkali metal hydrogen sulfate;

(b) contacting said aqueous solution of alkali metal hydrogen sulfate with a hydrophilic solvent which is selected from the group consisting of n-butyl alcohol, isobutyl alcohol, n-pentyl alcohol, isopentyl alcohol, n-hexyl alcohol, n-heptyl alcohol, n-octyl alcohol, n-nonyl alcohol, and mixtures thereof, said solvent being effective to extract at least a portion of the sulfuric acid formed as the alkali metal hydrogen sulfate is converted to alkali metal sulfate; said extraction providing a mixture comprising alkali metal sulfate, hydrophilic solvent, sulfuric acid, and water;

(c) separating the hydrophilic solvent phase from the said mixture to form a residual mixture, and separating the sulfuric acid from the hydrophilic solvent by extraction of the hydrophilic solvent with a hydrophobic solvent;

(d) passing the residual mixture to a crystallizer to precipitate the alkali metal sulfate solid; and

(e) recovering the solid alkali metal sulfate product.

4,371,513
ALUMINA COMPOSITIONS

Moises G. Sanchez, Severna Park, and Norman R. Laine, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 20,114, Mar. 13, 1979, abandoned, which is a continuation of Ser. No. 781,393, Mar. 25, 1977, Pat. No. 4,154,812. This application Feb. 19, 1981, Ser. No. 235,876
The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.
Int. Cl.[3] C01F 7/02
U.S. Cl. 423—625 11 Claims

1. An alumina composition comprising a microcrystalline boehmite-pseudoboehmite intermediate, said composition having a calcium content expressed as CaO that does not exceed 0.15 weight percent, a [020] d spacing of from about 6.2 to about 6.5 A., and a nitrogen pore volume of about 0.60 to about 0.75 $cm.^3/g.$, said pore volume determined after a thermal treatment for about 1 hour at about 1850° F., and requiring from about 130 to about 180 milliequivalents of sulfuric acid per mole of alumina to change the pH of a water slurry of the composition from about 8.3 to about 4.0.

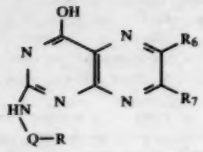
11. An alumina composition comprising a substantially pure, microcrystalline boehmite-pseudoboehmite intermediate, said composition having a [020] d spacing of about 6.3 to about 6.4 A, a nitrogen pore volume of about 0.64 to about 0.72 $cm.^3/g.$, and a surface area of about 110 to about 140 $m.^2/g.$, said pore volume and surface area determined after a thermal treatment for about 1 hour at about 1850° F.

4,371,514
RADIOIMMUNOASSAY OF PTERINS AND NOVEL PTERIN DERIVATIVES USEFUL THEREFOR

Toshiharu Nagatsu; Takeshi Kato, both of Yokohama; Tokio Yamaguchi, Hachiojî; Miki Akino, Musashino; Sadao Matsuura, Nagoya, and Takashi Sugimoto, Chiryu, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,519
Claims priority, application Japan, Jul. 4, 1979, 54/84568; Jan. 11, 1980, 55/1841
Int. Cl.[3] G01N 33/56, 33/58; C07D 475/00
U.S. Cl. 424—1 16 Claims

10. A method of radioimmunoassay for determining pterines, comprising mixing an unknown sample or a known amount of a standard with a labeled compound of the formula



wherein R represents a radioiodinated hydroxyphenyl group or a radioiodinated tyraminocarbonyl group; Q represents a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and R_6 and R_7 each represents hydrogen, an alkyl group having from 1 to 6 carbon atoms, or a hydroxyalkyl group having from 1 to 6 carbon atoms, and anti-pterines antibody, separating bound labeled compound from remaining free labeled compound, and counting the radiation emitted from either the bound labeled compound or the free labeled compound in a gamma counter.

4,371,515

METHOD FOR FORMING AN ISOLATED LECTIN-IMMUNOLOGICAL CONJUGATE

Albert E. Chu, San Mateo, Calif., assignor to E-Y Laboratories, Inc., San Mateo, Calif.

Filed Dec. 26, 1978, Ser. No. 972,921

Int. Cl.³ G01N *33/50;* **C07H** *1/00;* **C12P** *1/00, 21/00;* **C12Q** *1/00*

U.S. Cl. 436—544 **17 Claims**

1. A method for forming an isolated reaction product of a lectin covalently bonded to a reactive component capable of forming an immunological conjugate pair comprising the steps of

(a) covalently reacting said lectin and reactive component to form a bound lectin-reactive component mixed with non-reacted free reactive component and free lectin in a fluid reaction mixture,

(b) immunologically reacting the free and bound reactive component in said reaction mixture with its corresponding conjugate pair component in insolubilized form,

(c) separating said insolubilized immunological reaction product formed in step (b) from the remainder of said fluid reaction mixture containing free lectin,

(d) breaking the immunological bonds in said immunological reaction product to form a solution containing soluble free and bound reactive component,

(e) separating the soluble and insoluble portions of step (d),

(f) contacting the separated soluble portion of step (e) with insolubilized sugar moieties selectively and reversibly reactive with said lectin to permit the sugar and lectin of the bound lectin-reactive component to react, and

(g) separating the insolubilized sugar-lectin-reactive component product from the remainder of the solution containing free soluble reactive component.

4,371,516

ARTICLES FOR CARRYING CHEMICALS

George K. E. Gregory, Marlow; James M. Peach, High Wycombe, and James D. Du Mayne, Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation of Ser. No. 837,345, Sep. 28, 1977, abandoned. This application Jul. 17, 1981, Ser. No. 284,025

Claims priority, application United Kingdom, Oct. 6, 1976, 41483/77

Int. Cl.³ A61K *9/26*

U.S. Cl. 424—22 **5 Claims**

1. A pharmaceutical dosage form for oral administration as a solid, which dosage form can be disintegrated by water within ten seconds and which consists essentially of an open matrix network carrying a unit dosage of a pharmaceutical substance, the open matrix network consisting essentially of a pharmacologically acceptable water-soluble or water-dispersible carrier material, selected from the group consisting of partially hydrolysed gelatin, hydrolysed dextran, alginate, and a mixture of at least one of the above carrier materials with polyvinyl alcohol, polyvinylpyrrolidine or acacia.

4,371,517

COMPOSITION FOR TREATING FIBROUS MATERIALS, BASED ON CATIONIC AND ANIONIC POLYMERS

Guy Vanlerberghe, Villevaude; Henri Sebag; Alexandre Zysman, both of Paris, and Claude Dubief, Guyancourt, all of France, assignors to L'Oreal, Paris, France

Filed Sep. 12, 1979, Ser. No. 75,197

Claims priority, application France, Sep. 13, 1978, 78 26343

Int. Cl.³ A61K *7/06;* **D06M** *9/00*

U.S. Cl. 424—70 **15 Claims**

1. A composition suitable for the treatment of fibrous materials which is in the form of an aqueous composition containing at least one cationic polymer which is a polyamine or quaternary polyammonium polymer in which the amine or ammonium group forms part of the polymer chain or is joined to the latter, at least one anionic polymer containing carboxylic groups, at least one alkali metal salt and at least one surface-active agent, the only surface-active agents in the composition being surface-active agents which are either non-ionic or contain one or more carboxyl or carboxylate groups in addition to one or more non-ionic groups, the cationic polymer and the anionic polymer each being present in an amount from about 0.25 to 3% by weight, the at least one surface-active agent being present in an amount from about 1 to 50% by weight, and the alkali metal salt being a halide, sulfate, acetate or lactate.

13. Process for treating fibrous material which comprises applying thereto a composition as defined in claim 1.

15. Process according to claim 13 for treating human hair in which the composition is in the form of a shampoo, a colouring product, a rinsing lotion intended to be applied before or after shampooing, before or after colouring or bleaching or before or after permanent waving, a brushing lotion or a restructuring lotion.

4,371,518

CARRIERS FOR SPERMICIDAL SUBSTANCES

Giovanni Gazzani, Appiano Gentile, Italy, assignor to Crinos Industria Farmabiologica S.p.A., Villa Guardia, Italy

Filed May 26, 1981, Ser. No. 267,393

Claims priority, application Italy, Jun. 20, 1980, 22910 A/80

Int. Cl.³ A61K *31/09, 31/74, 47/00*

U.S. Cl. 424—78 **5 Claims**

1. A spermicidal composition for topical use containing an active amount of a known spermicidal agent dispersed in a suitable vehicle, wherein said vehicle consists of a water insoluble hydrophilic crosslinked dextran in an amount sufficient to have an absorptive capacity greater than the amount of sperm which can be ejaculated in a single ejaculation.

4,371,519

METHODS OF TREATING CELLULAR TISSUE

William P. Hettinger, Jr., 10 Wispering Pines Rd., Sudbury, Mass. 01776

Continuation of Ser. No. 259,556, Jun. 5, 1972, Pat. No. 3,975,516, which is a continuation-in-part of Ser. No. 881,616, Dec. 2, 1969, abandoned. This application May 4, 1976, Ser. No. 683,079

The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **1 Claim**

1. A process for encasement and infiltration of animal cellular tissue within the animal body to reduce the influx of oxygen and liquids thereto, to reduce the efflux of liquids therefrom,

and to retain in situ and retard efflux of therapeutic agents from the cellular tissue and to block capillary and extra cellular plasma flow, comprising the steps of injecting into the body of said animal tissue an effective amount of a fluid polymerizable gel forming material substantially insoluble in said tissue and the body fluids associated therewith to effect encasement and infiltration of said tissue by said gel and polymerizing said gel to cause gelation in situ within said tissue in which the gel forming polymerizable material consists of a member selected from the group consisting of acrylamide and N,N[1]-methylenebisacrylamide.

4,371,520

PROCESS FOR PREPARING IMMUNOGLOBULIN SUITABLE FOR INTRAVENOUS INJECTION

Yahiro Uemura; Takashi Goto, both of Hirakata; Yoshiaki Kano, Osaka, and Satoshi Funakoshi, Katano, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Oct. 28, 1981, Ser. No. 316,042

Int. Cl.[3] A61K *39/00*

U.S. Cl. 424—85 **8 Claims**

1. A process for preparing an immunoglobulin suitable for intravenous injection, which consists essentially of treating a plasma or the Cohn's fraction I+II+III, fraction II+III, fraction II, or fraction III obtained by subjecting a plasma to Cohn's cold alcohol fractionation with an acid at pH 3.2 to 5.0 and at 4° to 15° C. for 30 to 180 minutes, adding to the resulting material at pH 4.6 to 5.4 an alkylene oxide polymer or copolymer having a molecular weight of 2,000 to 20,000 to a concentration of 4.5 to 5.5% (W/V), removing an aggregate-type immunoglobulin as a precipitate, and adding again said polymer or copolymer at pH 8.0 to 9.0 to a concentration of 6 to 13% (W/V) to recover as a precipitate a non-aggregate-type immunoglobulin containing substantially no aggregate-type immunoglobulin.

4,371,521

PHARMACEUTICAL COMPOSITION FOR RETARDING EXCESSIVE PLATELET AGGREGATION

Victor Izrael, 22 rue des Francs Bourgeois, Paris, France

Filed Jun. 11, 1974, Ser. No. 478,367

Claims priority, application France, Jun. 27, 1973, 73 23441

Int. Cl.[3] A61K *31/66, 37/48*

U.S. Cl. 424—94 **3 Claims**

1. A liquid solution capable of being directly injected into the bloodstream in dosage unit form which comprises creatine-phosphate and creatine-phosphokinase and a pharmaceutically acceptable solvent, there being present in said liquid solution from 30 to 3000 parts by weight of creatine-phosphate per single part by weight of creatine-phosphokinase.

4,371,522

KERATOCONJUNCTIVITIS SICCA THERAPY

Jeffrey P. Gilbard, 20 Mt. Vernon St., Boston, Mass. 02108

Continuation-in-part of Ser. No. 27,294, Apr. 25, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,832

Int. Cl.[3] A61K *33/14*

U.S. Cl. 424—153 **7 Claims**

1. A method of relieving discomfort in eyes of patients afflicted with keratoconjunctivitis sicca which comprises adjusting the tonicity of the eyes by contacting the eyes of said patients with an ophthalmically acceptable hypotonic solution of a concentration of between 75 to 225 mOsm/l.

4,371,523

REDUCING THE AGGREGATION OF INSULIN IN SOLUTION

Gerold M. Grodsky, San Francisco, Calif., and Jacques Bringer, Montpellier, France, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 29, 1980, Ser. No. 220,779

Int. Cl.[3] A61K *37/26*

U.S. Cl. 424—178 **12 Claims**

1. A method of reducing the aggregation of insulin in a solution which is retained over extended periods of time in a reservoir under agitation and at about body temperature comprising admixing into said insulin solution an effective amount of an anti-aggregation agent having two carboxyl moieties and at least one amino or amino derivative moiety, and adjusting the pH of said insulin solution to a pH at about the isoelectric point of the anti-aggregation agent.

4,371,524

ANTICOMPLEMENTARY AGENTS COMPRISING SOYASAPOGENOL B COMPOUNDS

Masanao Shinohara, Naruto; Yoshimasa Nakano, Tokushima; Hirotsugu Kaise, Tokushima; Taketoshi Izawa, Tokushima, and Wasei Miyazaki, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 25,517, Mar. 30, 1979, abandoned. This application Mar. 6, 1981, Ser. No. 241,294

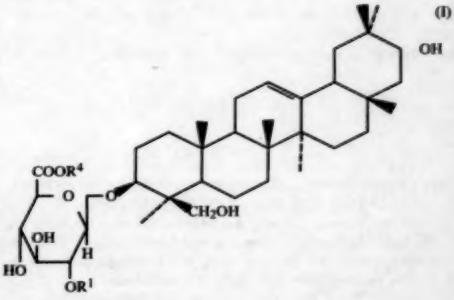
Claims priority, application Japan, Mar. 31, 1978, 53-38536; May 17, 1978, 53-59345

The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.

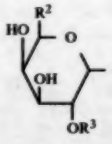
Int. Cl.[3] A61K *31/70*

U.S. Cl. 424—180 **7 Claims**

1. A method for treating nephritis, which comprises administering an antinephritic pharmaceutical composition comprising (a) an antinephritic therapeutically effective amount of at least one soyasapogenol B compound represented by the general formula (I):



wherein R^1 represents a hydrogen atom or a group represented by the formula:

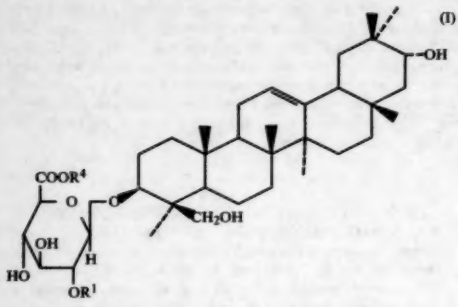


wherein R^2 represents a hydrogen atom or a hydroxymethyl group, R^3 represents a hydrogen atom or a rhamnopyranosyl group, and R^4 represents a hydrogen atom or an alkyl group having 1 to 6 carbon atom, with the proviso that R^1 and R^4 are not simultaneously hydrogen atoms,

or pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier,

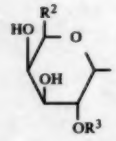
to a nephritic patient in a daily dose of about 0.5 to about 20 mg/kg of body weight per day.

2. A method for inhibiting the complement system in a body fluid which comprises subjecting said fluid to the action of an effective complement inhibiting amount of a compound represented by the general formula (I):



(I)

wherein R^1 represents a hydrogen atom or a group represented by the formula:



wherein R^2 represents a hydrogen atom or a hydroxymethyl group, R^3 represents a hydrogen or a rhamnopyranosyl group, and R^4 represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms,

or pharmaceutically acceptable salts thereof.

4,371,525

SILYL-BENZIMIDAZOLE-2-CARBAMIC ACID ESTERS AND THEIR USE AS FUNGICIDES

Rolf-Dieter Acker, Leimen; Karl-Heinz Koenig, Frankenthal; Gerhard Hamprecht, Weinheim, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

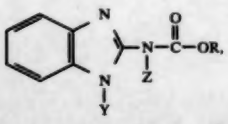
Filed Nov. 18, 1980, Ser. No. 208,034

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948672

Int. Cl.³ A01N *55/00;* **C07F** *7/10*

U.S. Cl. 424—184 **10 Claims**

1. A silyl-benzimidazole-2-carbamic acid ester of the formula

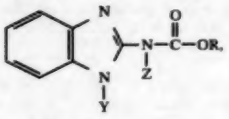


(I)

where Y and Z are hydrogen or a silyl radical of the formula

where R^1, R^2 and R^3 independently of one another are unsubstituted or halogen-substituted alkyl, alkenyl or alkynyl of up to 12 carbon atoms, cycloalkyl of up to 7 carbon atoms which is unsubstituted or substituted by alkyl or alkynyl of up to 4 carbon atoms, or phenyl which is unsubstituted or substituted by halogen or alkyl of up to 4 carbon atoms, and R is alkyl of up to 4 carbon atoms, with the proviso that Y and Z are not both hydrogen.

10. A method of combating fungi which comprises applying to the fungi or to areas, plants or seed threatened by fungus attack a fungicidally effective amount of a silyl-benzimidazole-2-carbamic acid ester of the formula



(I)

where Y and Z are hydrogen or a silyl radical of the formula

where R^1, R^2 and R^3 independently of one another are unsubstituted or halogen-substituted alkyl, alkenyl or alkynyl of up to 12 carbon atoms, cycloalkyl of up to 7 carbon atoms which is unsubstituted or substituted by alkyl or alkynyl of up to 4 carbon atoms, or phenyl which is unsubstituted or substituted by halogen or alkyl of up to 4 carbon atoms, and R is alkyl of up to 4 carbon atoms, with the proviso that Y and Z are not both hydrogen.

4,371,526

PHOSPHINYLALKANOYL SUBSTITUTED 4,5-DIHYDROPYRAZOLE-5-CARBOXYLIC ACID DERIVATIVES AND HYPOTENSIVE METHOD AND COMPOSITION

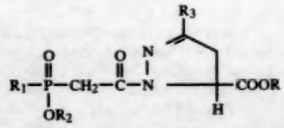
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1981, Ser. No. 294,944

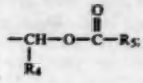
Int. Cl.³ A61K *31/675, 31/685;* **C07F** *9/58, 9/65*

U.S. Cl. 424—200 **12 Claims**

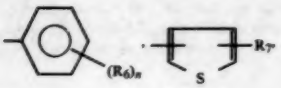
1. A compound of the formula:

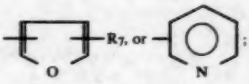


or a basic, physiologically acceptable salt thereof wherein R and R_2 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbons, benzyl, and

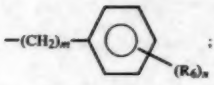


R_3 is hydrogen, alkyl,

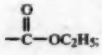




R_1 is alkyl or



R_4 is hydrogen, lower alkyl of 1 to 4 carbons, phenyl, or



R_5 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, phenyl, or R_4 and R_5 taken together are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$, or

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

n is one, two or three provided that n is two or three only if R_6 is hydrogen, methyl, methoxy, chloro, or fluoro;

R_7 is hydrogen, lower alkyl of 1 to 4 carbons, chloro, bromo, or fluoro; and

m is zero or an integer from 1 to 8.

4,371,527

THERAPEUTIC PROCESS WITH DIPHOSPHONATE COMPOUNDS

Craig L. Bentzen, Onex; Lan Nguyen Mong, Nyon, and Eric Niesor, Gland, all of Switzerland, assignors to Symphar S.A., Geneva, Switzerland

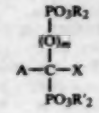
Division of Ser. No. 114,423, Jan. 22, 1980, Pat. No. 4,309,364. This application Nov. 18, 1980, Ser. No. 208,008

Claims priority, application United Kingdom, Feb. 13, 1979, 7904992; Sep. 25, 1979, 7933157

Int. Cl.³ A61K *31/66*

U.S. Cl. 424—204 **14 Claims**

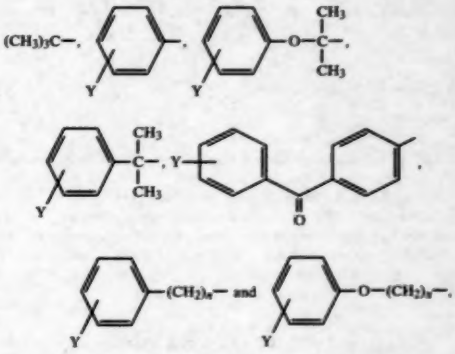
1. A method of increasing the quantity of circulating high density lipoproteins and clearing cholesterol from various tissues, in humans, comprising administering to a human an amount effective to increase the quantity of circulating high density lipoproteins and to clear cholesterol from various tissues, of a diphosphonate compound of



(I)

where X is H, OH,

or NH_2; R and R' identical or different are H, CH_3 or C_2H_5; m is zero or 1; and A is selected from the group consisting of



where n is an integer from 1 to 6 and Y is H, CH_3, OCH_3 or Cl.

4,371,528

CONTROLLING MICRO-ORGANISMS

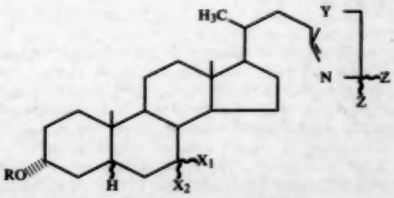
Erwin H. Mosbach, 300 Central Park West, New York, N.Y. 10024; Charles K. McSherry, 10 Nathan D.Perlman Pl., New York, N.Y. 10003, and Phillip B. Hylemon, MCV Station, Richmond, Va. 23298

Filed Mar. 22, 1982, Ser. No. 360,708

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 **4 Claims**

1. The method of controlling microorganisms, which comprises subjecting said microorganisms to the action of a small but effective amount of a compound of the formula,



wherein R is H or acyl; Y is N, O or S; each Z is H, lower alkyl, OH, aryl, arakyl, substituted-lower alkyl cycloalkyl or substituted acyl; X_1 is H, OH, acyloxy, alkyl or aryl; X_2 is H, OH, acyloxy, alkyl, aryl, alkoxy, aryloxy, or aralkyl; X_1 and X_2

when taken together is oxo (O=); and the non-toxic, pharmaceutically acceptable salts thereof.

4,371,529

11-METHYLENE-Δ^{15}-STEROIDS, THEIR PREPARATION AND USE IN PHARMACEUTICALS

Helmut Hofmeister; Karl Petzoldt; Klaus Annen; Henry Laurent; Rudolf Wiechert, and Hermann Steinbeck, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

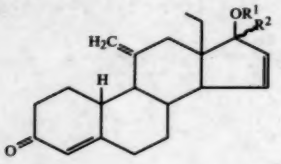
Filed Nov. 6, 1981, Ser. No. 318,906

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042529

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 **14 Claims**

1. An 11-Methylene-Δ^{15}-steroid of the formula



wherein

R^1 is hydrogen or an acyl group of a C_{1-15} hydrocarbon carboxylic acid, and

R^2 is ethynyl, chloroethynyl or propynyl.

13. A method of achieving a progestational effect in a patient in need of such treatment comprising administering to the patient a progestationally effective amount of a compound of claim 1.

4,371,530

AMINOCYCLOPENTANONE AMIDES AND PHARMACEUTICAL FORMULATION

Eric W. Collington, Welwyn; Peter Hallet, Buntingford; Christopher J. Wallis, Royston, and Norman F. Hayes, Hitchin, all of England, assignors to Glaxo Group Limited, London, England

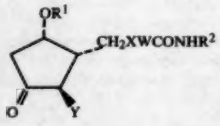
Filed Jul. 2, 1981, Ser. No. 279,825

Claims priority, application United Kingdom, Jul. 4, 1980, 8022048

Int. Cl.³ A61K *31/535, 31/55*; C07D *295/14*

U.S. Cl. 424—244 **9 Claims**

1. Compounds of the general formula (I)



(I)

wherein

R^1 is (i) straight or branched C_{1-5} alkyl substituted by (a) phenyl optionally substituted by C_{1-6} alkyl, C_{5-7} cycloalkyl, phenylalkyl having a C_{1-3} alkyl portion, thienyl or phenyl (optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy or phenyl), (b) thienyl optionally substituted by C_{1-6} alkyl, C_{1-6} alkoxy, C_{5-7} cycloalkyl or phenyl (optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen), or (c) naphthyl (optionally substituted by C_{1-4} alkyl or C_{1-4} alkoxy), or (ii) cinnamyl;

R^2 is a hydrogen atom, a methyl group, $-(CH_2)_nOR^3$ (where n is 2–5 and R^3 is C_{1-4} alkyl) or $-CHR^4(CH_2)_mCOOH$ (where R^4 is a hydrogen atom or a methyl group and m is 0–2);

W is straight or branched C_{1-7} alkylene;

X is cis or trans $-CH=CH$ or $-CH_2CH_2-$;

Y is a saturated heterocyclic amino group (attached to the cyclopentane ring via the nitrogen atom) which has 5–8 ring members and (a) optionally contains in the ring —O—, —S—, $-SO_2-$, or $-NR^5$ (where R^5 is a hydrogen atom, C_{1-7} alkyl or aralkyl having a C_{1-4} alkyl portion); or (b) is optionally substituted by one or more C_{1-4} alkyl groups;

and the physiologically acceptable salts and solvates thereof.

9. A pharmaceutical composition comprising a compound as claimed in claim 1 and one or more pharmaceutical carriers.

4,371,531

CEPHALOSPORIN COMPOUNDS

Takao Takaya, Sakai; Takashi Masugi, Toyonaka; Takashi Ogino, Kobe, and Kiyoshi Tsuji, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

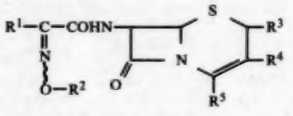
Division of Ser. No. 916,858, Jun. 19, 1978, Pat. No. 4,242,510, which is a continuation-in-part of Ser. No. 863,923, Dec. 23, 1977, abandoned. This application Aug. 18, 1980, Ser. No. 178,898

Claims priority, application Japan, Dec. 27, 1976, 51-160698; Dec. 5, 1977, 52-146327

Int. Cl.³ A61K *31/545*

U.S. Cl. 424—246 **30 Claims**

1. A compound of the formula:



wherein R^1 is a group of the formula:

in which

X is sulfur, oxygen, imino or lower alkanoyl-substituted imino,

R^2 is hydrogen, lower alkyl or lower alkenyl,

R^3 is hydrogen or lower alkyl,

R^4 is hydrogen, halogen, lower alkyl, carbamoyloxymethyl or lower alkanoyloxymethyl, and

R^5 is carboxy or its ester, and a non-toxic, pharmaceutically acceptable salt thereof.

30. A pharmaceutical composition which comprises an effective amount of a compound according to claim 1 as an active ingredient and pharmaceutically acceptable, nontoxic carrier(s).

4,371,532

MALONAMIDOOXADETHIACEPHEM COMPOUNDS

Masayuki Narisada, Ibaraki, and Tetsuo Okada, Sakai, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

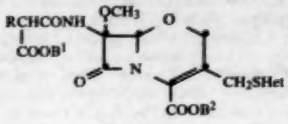
Filed Jan. 22, 1981, Ser. No. 227,202

Claims priority, application Japan, Jan. 22, 1980, 55-5313

Int. Cl.³ C07D *413/14, 498/04*; A61K *31/535, 31/425*

U.S. Cl. 424—248.51 **15 Claims**

1. A compound of the following formula



wherein

R is C_1 to C_6-alkyl, C_2 to C_5-alkenyl, C_2 to C_5-alkynyl or C_1 to C_2-alkylthio-C_1 to C_2-alkyl;

Het is a member selected from the group consisting of 2-methyl-1,3,4-thiadiazol-5-yl, 1-methyl-5-tetrazolyl, and 2-thiadiazolyl; and

B^1 and B^2 each is (1) a hydrogen atom, (2) an ester protecting group selected from the group consisting of mono- or di-cyclic aralkyl, C_4 to C_{10}-tertiary alkyl, C_1 to C_{10}-β-haloalkyl and C_3 to C_8-β-alkylsulfonylalkyl, (3) a pharmaceutically acceptable ester selected from the group consisting of straight or branched chain C_3 to C_{19}-alkanoyloxyalkyl, C_3 to C_6-alkoxycarbonyloxyalkyl, C_4 to C_6-tertiary alkyl, C_7 to C_{13}-aralkyl and C_7 to C_9-aryl, and (4) a pharmaceutically acceptable salt forming atom or group.

14. An antibacterial composition comprising an antibacterially effective amount of a compound according to claim **1** as an active ingredient and a pharmaceutically acceptable carrier therefor.

4,371,533

4,5-DEOXYMAYTANSINOIDS, THEIR USE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hiroshi Akimoto, and Akiyoshi Kawai, both of Kobe, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

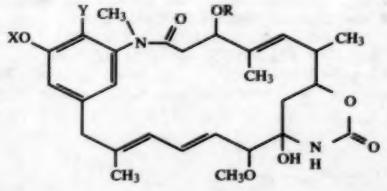
Filed Sep. 29, 1981, Ser. No. 306,776

Claims priority, application Japan, Oct. 8, 1980, PCT/JP80/00240

Int. Cl.[3] **C07D** *498/16;* **A61K** *31/535*

U.S. Cl. 424—248.54 **12 Claims**

1. A compound of the formula:



wherein

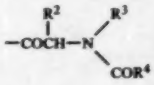
X is hydrogen, C_{1-5}alkyl which is unsubstituted or substituted with halogen, carboxyl, C_{2-5} alkoxycarbonyl, phenoxycarbonyl, C_{1-4} alkoxy, benzyloxy, C_{1-4} alkylthio, benzylthio, phenylthio, C_{1-4} alkylsulfinyl, benzylsulfinyl, phenylsulfinyl, C_{1-4} alkylsulfonyl, benzylsulfonyl, phenylsulfonyl, C_{1-5} alkanoyloxy, benzoyloxy, phenylacetyloxy, cyano, di(C_{1-4}alkyl)amino, oxo, (C_{1-4})-1-alkylidene, phenyl, α- or β-naphthyl, vinyl, ethynyl, C_{3-6} cycloalkyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl, piperidinyl, piperazinyl, pyrrolyl, pyrrolidinyl, pyrrolinyl, imidazolyl, pyrazolyl, triazolyl, tetrazolyl, imidazolinyl, pyrazolidinyl, imidazolidinyl, triazolidinyl, furyl, furanyl, tetrahydrofuryl, thienyl, morpholino, oxazolyl, oxazolinyl, thiazolyl, thiazolinyl, oxadiazolyl, thiadiazolyl, oxiranyl, dioxolanyl or/and dithiolanyl,

or X is acyl derived from a C_{1-20} carboxylic acid of the formula:

$$-COR^1$$

wherein R^1 is hydrogen, C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, phenyl, naphthyl, any of said groups being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, hydroxyl, nitro, cyano, trifluoromethyl, amino, mono(C_{1-4} alkyl)amino, di(C_{1-4} alkyl)amino, C_{1-4} alkylthio, C_{1-4} alkylsulfinyl, C_{1-4} alkanesulfonyl, oxo, thioxo or C_{1-4} alkanoylamino, and said cycloalkyl, cycloalkenyl, phenyl and naphthyl being attached, directly or through C_{1-4} alkylene, to the carbonyl radical in the acyl group,

or X is of the formula:



wherein

R^2 is hydrogen, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl or naphthyl,

R^3 is hydrogen, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl or naphthyl, and

R^4 is hydrogen, C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, phenyl or naphthyl, any of said groups in R^2, R^3 and R^4 being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, hydroxyl, nitro, cyano, trifluoromethyl, amino, mono(C_{1-4} alkyl) amino, di(C_{1-4} alkyl) amino, C_{1-4} alkylthio, C_{1-4} alkylsulfinyl, C_{1-4} alkanesulfonyl, oxo, thioxo or C_{1-4} alkanoylamino, and said cycloalkyl, cycloalkenyl, phenyl and naphthyl in R^2, R^3 and R^4 being attached, directly or through C_{1-4} alkylene, to the α-carbon atom, N-atom or the carbonyl group on the N-atom,

or wherein X is acyl derived from an organic sulfonic acid of the formula:

$$-SO_2R^5$$

wherein

R^5 is C_{1-4} alkyl or C_{7-9} aralkyl or acyl derived from carbamic acid of the formula:

$$-CONR^6R^7$$

wherein

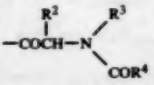
R^6 and R^7 are the same or different and each is hydrogen, C_{1-6} alkyl, C_{3-6} cycloalkyl, benzyl, phenethyl, phenyl or α- or β-naphthyl;

Y is hydrogen or chlorine; and

R is hydrogen or acyl derived from C_{1-20} carboxylic acid of the formula:

$$-COR^1$$

wherein R^1 is the same as defined above, or R is of the formula:



wherein R^2, R^3 and R^4 are the same as defined above.

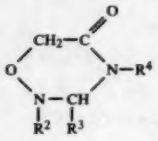
12. A method for inhibiting the growth of tumor cells and prolonging the survival time of a warm-blooded animal, which comprises administering to said animal an effective amount of a compound of claim **4**, **5**, **6**, **7**, **8**, **9**, **10**, **1**, **2** or **3**.

4,371,534
N4-SUBSTITUTED TETRAHYDRO-1,2,4-OXADIAZIN-5-ONE DERIVATIVES HAVING ANTICONVULSIVE ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Laszlo Ürogdi; Agnes Patthy nee Lukats; Lajos Kisfaludy; Ernö Moravcsik; Helga Tüdos nee Feur; László Ötvös; Zsuzsanna Tegyei; Eva Pálosi; Ádám Sarkadi; László Szporny, all of Budapest, Hungary

Filed Dec. 29, 1981, Ser. No. 335,342
Claims priority, application Hungary, Dec. 31, 1980, 3165/80
Int. Cl.³ A61K *31/535;* C07D *273/04*
U.S. Cl. 424—248.55 5 Claims

1. A tetrahydro-1,2,4-oxadiazin-5-one of the formula (1)



(1)

wherein

R^2 is benzyloxycarbonyl or alkylcarbonyl containing 1 to 4 carbon atoms in the alkyl moiety;

R^3 is phenyl optionally substituted by 1 to 3 lower alkoxy groups;

R^4 is an aliphatic or cyclic alkyl group having 1 to 11 carbon atoms, hydroxymethyl, halogenmethyl or acyloxymethyl.

5. A anticonvulsive composition which comprises as active ingredient a pharmaceutically effective amount of a compound of formula (1), in which R^2, R^3 and R^4 are as defined in claim 1, in association with at least one pharmaceutical inert carrier or diluent.

4,371,535
METHOD OF AND COMPOSITION FOR DELIVERING 5-FLUOROURACIL TO TUMORS

Norio Unemi; Kenji Kitazato, and Setsuro Fujii, all of Tokushima, Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 902,505, May 3, 1978, abandoned, which is a continuation of Ser. No. 735,019, Oct. 22, 1976, abandoned. This application Nov. 5, 1979, Ser. No. 91,530
Claims priority, application United Kingdom, Jan. 7, 1976, 0040776
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 12 Claims

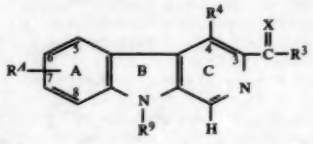
1. A method of delivering 5-fluorouracil to a cancer in a patient, wherein the cancer is sensitive to 5-fluorouracil therapy, said method comprising administering to said patient an amount of 1,3-bis(2-tetrahydrofuryl)-5-fluorouracil which is effective to deliver an anti-cancer effective amount of 5-fluorouracil to said cancer.

4,371,536
β-CARBOLIN-3-CARBOXYLIC ACID DERIVATIVES

Claus T. Braestrup, Gentofte; Mogens C. Nielsen, Roskilde; Joergen A. Christensen, Virum; Mogens Engelstoft, Vaerloese; Henning Schou, Copenhagen, all of Denmark; Ulrich Eder, Berlin, Fed. Rep. of Germany; Günter Neef, Berlin, Fed. Rep. of Germany; Andreas Huth, Berlin, Fed. Rep. of Germany; Dieter Rahtz, Berlin, Fed. Rep. of Germany, and Ralph Schmiechen, Berlin, Fed. Rep. of Germany, assignors to A/S Ferrosan, Soeborg, Denmark and Scherling AG, Berlin, Fed. Rep. of Germany

Filed Aug. 28, 1980, Ser. No. 182,244
Claims priority, application Denmark, Aug. 29, 1979, 3622/79; Sep. 29, 1980, 889/80; Fed. Rep. of Germany, Apr. 22, 1980, 3015816; Jun. 20, 1980, 3023567
Int. Cl.³ A61K *31/435;* C07D *487/14*
U.S. Cl. 424—256 6 Claims

1. A β-carbolin-3-carboxylic acid derivative of the formula



wherein:

X is oxygen or sulfur;

R^3 is C_{1-10}-alkoxy, propenyloxy, benzyloxy, trifluoromethylmethoxy or C_{1-6}-hydroxyalkoxy;

R^4 is H, C_{1-5}-alkyl, cyclopentyl, cyclohexyl, phenyl, or p-methoxyphenyl;

R^4 is nitro, SCH_3, or $NR^{13}R^{14}$, wherein R^{14} is hydrogen or C_{1-6}-alkyl; and

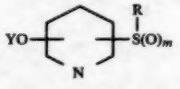
R^9 is hydrogen.

4,371,537
SULFUR-SUBSTITUTED PHENOXYPYRIDINES HAVING ANTIVIRAL ACTIVITY

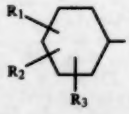
Lowell D. Markley, Midland, Mich.; Yulan C. Tong, Walnut Creek, Calif., and Steven G. Wood, Orem, Utah, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1981, Ser. No. 292,467
Int. Cl.³ A61K *31/44;* C07D *212/63*
U.S. Cl. 424—263 67 Claims

1. An antiviral compound corresponding to the formula:



wherein m represents the integer 0, 1 or 2; R represents an alkyl group of from 1 to 7 carbon atoms, inclusive, a cycloalkyl group of 5 or 6 carbon atoms, or a Ar-$(CH_2)_q$- group wherein q represents the integer 0, 1, 2 or 3 and Ar represents an aryl group of from 6 to 10 carbon atoms, inclusive, which aryl group is optionally substituted with 1 to 3 substituents each independently selected from bromo, chloro, fluoro, methyl or methoxy; Y represents:



wherein R_1 and R_2 each independently represent hydrogen,

bromo, chloro, fluoro, iodo, cyano, nitro, acetyl or the following moieties:

(a) a benzyl, phenoxy or benzoyl group, wherein the benzene ring of the benzyl, phenoxy or benzoyl group is optionally substituted with 1 to 3 substituents each independently selected from bromo, chloro, fluoro, methyl or methoxy;

(b) an alkyl group of 1 to 4 carbon atoms, inclusive, optionally substituted with 1 to 4 substituents each independently selected from bromo, chloro or fluoro;

(c) R_4X-, wherein X represents an oxygen or sulfur atom; and R_4 represents an alkyl group of from 1 to 3 carbon atoms, inclusive, the alkyl portion optionally substituted with 1 to 4 substituents each independently selected from bromo, chloro or fluoro; or

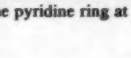
(d) alternatively R_1 and R_2 taken together represent methylenedioxy; and

R_3 represents hydrogen, bromo, chloro, fluoro or iodo; provided that:

(1) in those situations where the —OY radical is attached to the pyridine ring at the 3 position then the

radical is attached at the 5 position;

(2) in those situations where the —OY radical is attached to the pyridine ring at the 4 position then the



radical is attached at the 2 position;

(3) in those situations where m represents the integer 0 or 1; then:

(i) the radical —OY must be attached to the pyridine ring at the 2 position and the:

radical at either the 3 or 5 positions; or

(ii) the radical —OY must be attached to the pyridine ring at the 3 position and the:

radical at the 5 position; and

(4) in those situations where R is Ar-$(CH_2)_q$- or optionally substituted Ar-$(CH_2)_q$- and R_2 and R_3 are both hydrogen, then R_1 is a substituent other than hydrogen.

4,371,538

SPIRO DERIVATIVES, PROCESS FOR THEIR PREPARATION AND MEDICATIONS CONTAINING SAME

Georges Tsatsas, Athens; Evan E. Costakis, Paraskevi Attikis, and Georges V. Foscolos, Piraeus, all of Greece, assignors to Etablissements Nativelle S.A., Paris, France

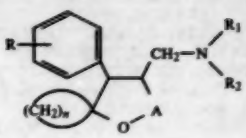
Filed Oct. 9, 1980, Ser. No. 195,692

Claims priority, application France, Oct. 9, 1979, 79 25041

Int. Cl.³ A61K *31/445*; C07D *307/94*

U.S. Cl. 424—267 **8 Claims**

1. Spiro derivatives of the general formula (I):



(I)

wherein R is a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; R_1 and R_2, which may be the same or different, represent a hydrogen atom, an alkyl group or together form a nitrogen-containing 5- or 6-membered heterocyclic ring in which the remaining atoms of said ring are carbon atoms; A represents a $>CH_2$ group or a $>CO$ group; and n is 4 or 5 and the pharmaceutically acceptable acid addition salts thereof.

4,371,539

CNS STIMULANTS

Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,827

Int. Cl.³ C07D *271/04*; A61K *31/42*

U.S. Cl. 424—272 **2 Claims**

1. The compound which is 3-[Methyl(phenylmethyl)amino]-N-[(phenylamino)carbonyl]sydnone imine or a pharmaceutically acceptable salt thereof.

2. A method for treating anergia which comprises administering 3-[methyl(phenylmethyl)amino]-N-[(phenylamino)carbonyl]sydnone imine or a pharmaceutically acceptable salt thereof, to a warm blooded animal in need thereof, orally or parenterally, in an amount sufficient to stimulate the central nervous system.

4,371,540

NITROIMIDAZOLES OF LOW TOXICITY AND HIGH ACTIVITY AS RADIOSENSITIZERS OF HYPOXIC TUMOR CELLS

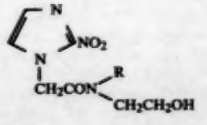
William W. Lee, Palo Alto; J. Martin Brown, Stanford; Abelardo P. Martinez, San Jose, all of Calif., and Michael J. Cory, Chapel Hill, N.C., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 75,603, Sep. 14, 1979, abandoned. This application Aug. 22, 1980, Ser. No. 180,373

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **6 Claims**

1. Method of radiosensitizing hypoxic tumor cells in a warm-blooded animal with reduced neurotoxic side effects comprising administering a compound of the formula



wherein R is hydrogen or a 2-hydroxyethyl radical to the animal systemically at a dosage level that radiosensitizes said cells.

4,371,541

ANTIINFLAMMATORY AND/OR ANALGESIC 3,4-DIHYDRO-(OR 1,4-DIHYDRO)-4-ARYL-2-((SUBSTITUTED)THIO)-(1)-BENZOPYRANO(3,4-D)IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

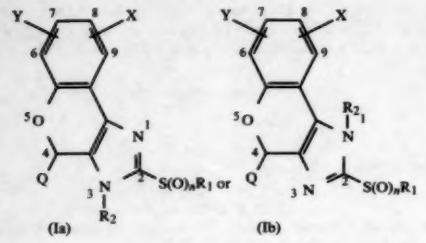
Michael Finizio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 248,009, Mar. 26, 1981, abandoned. This application Jan. 7, 1982, Ser. No. 336,822

Int. Cl.³ A61K *31/415;* C07D *491/052*

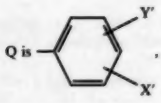
U.S. Cl. 424—273 R 13 Claims

1. A compound of the formula:



(Ia) (Ib)

wherein



pyridyl or thienyl;

n is 0, 1 or 2;

R_1 is alkyl of 1 or 2 carbon atoms, or mono- or polyhaloalkyl of 1 or 2 carbon atoms;

R_2 is H, C_1–C_6 alkyl,

2-tetrahydropyranyl,

2-tetrahydrofuranyl, 4-nitrobenzyl,

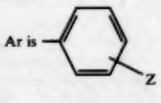
—$COOR_5$, —COR_5, —COAr or —SO_2Ar

where

R_3 is H or methyl;

R_4 is alkyl of 1 to 3 carbon atoms, benzyl, —$CH_2CH_2OCH_3$ or —COR_5;

R_5 is alkyl of 1–4 carbon atoms, or benzyl;



where

Z is H, F, Cl, Br, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms or nitro; with the proviso that when R_2 is 4-nitrobenzyl, n is 2 and when R_2 is —$COOR_5$, —COR_5, —COAr or —SO_2Ar, n is 0;

X, Y, X′ and Y′ are independently H, F, Cl, Br, NO_2, alkoxy of 1 or 2 carbon atoms, —$N(C_{1-2}$ alkyl$)_2$, alkyl of 1 or 2 carbon atoms, —$S(O)_mC_{1-2}$ alkyl where m is 0, 1 or 2; with the proviso that when X, Y, X′ or Y′ are H and R_1 is CH_3 then n cannot be 0; or

a pharmaceutically suitable acid addition salt thereof when n is 0 or when X, Y, X′ or Y′ is —$N(C_{1-2}$ alkyl$)_2$ or when Q is pyridyl; or

a pharmaceutically suitable metal salt thereof when n is 1 or 2 and R_2=H.

13. A method of treating inflammation, pain or both in a mammal which comprises administering to the mammal an effective antiinflammatory or analgesic amount of at least one compound of claim 1 or claim 2 or claim 3 or claim 4 or claim 5 or claim 6 or claim 7 or claim 8 or claim 9 or claim 10 or claim 11.

4,371,542

HETERO-IMINO-PROSTACYCLINS

Gerhard Beck, Frankfurt am Main; Jochen Knolle, Kriftel; Richard H. Rupp, Frankfurt am Main, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

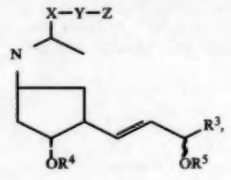
Filed Feb. 20, 1981, Ser. No. 236,634

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006865

Int. Cl.³ C07D *209/52;* A61K *31/40*

U.S. Cl. 424—274 9 Claims

1. A compound of the formula



wherein

X is oxygen, sulfur, or —NH—;

Y is linear or branched alkylene having up to 8 carbon atoms, linear or branched alkenylene having 3 to 8 carbon atoms, phenylene, or is cycloaliphatic having 3 to 6 carbon atoms;

Z is —CO_2R^1, —CH_2OH, or —$CH_2(R^2)_2$,

wherein

R^1 is hydrogen, linear or branched alkyl having up to 8 carbon atoms, linear or branched unsaturated aliphatic hydrocarbon having 3 to 6 carbon atoms, cycloaliphatic hydrocarbon having 3 to 7 carbon atoms, araliphatic hydrocarbon having 7 to 9 carbon atoms, a physiologically acceptable metal ion, NH_4^+, or is a monoalkyl-, dialkyl-, trialkyl-, tetraalkyl-, or cycloalkyl-ammonium ion;

R^2 is hydrogen or is linear or branched aliphatic hydrocarbon having up to 5 carbon atoms, or the two R^2 groups taken together are —$(CH_2)_n$— wherein n is an integer from 3 to 6 inclusive;

R^3 is phenyl or is phenyl mono-, di-, or tri-substituted by at least one member selected from the group consisting of halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, and alkoxy having 1 to 6 carbon atoms, or R^3 is cycloaliphatic having 3 to 8 carbon atoms, or is linear or branched alkyl having up to 8 carbon atoms, or is linear or branched unsaturated aliphatic hydrocarbon having 3 to 8 carbon atoms, or is such cycloaliphatic, alkyl, or unsaturated aliphatic hydrocarbon substituted by

(a) linear or branched alkoxy having up to 6 carbon atoms or linear or branched alkenyloxy or alkynyloxy having 3 to 6 carbon atoms,

(b) halogen, phenyl, α- or β-thienyl, or α- or β-furyl, or such phenyl, thienyl, or furyl mono-, di-, or tri-substituted by halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, or alkoxy having 1 to 6 carbon atoms, or

(c) phenoxy, α- or β-thienyloxy, or cycloalkoxy having 3 to

7 carbon atoms, or such phenoxy, thienyloxy, or cycloalkoxy mono-, di-, or tri-substituted by halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, or alkoxy having 1 to 6 carbon atoms; and

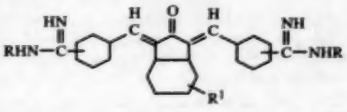
R^4 and R^5 are each hydrogen or an hydroxy-protective group which can readily be eliminated under neutral or basic conditions.

4,371,543
BIS-AMIDINE INDENE KETONES, COMPOSITIONS CONTAINING SAME AND METHOD OF USE

George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 5, 1981, Ser. No. 270,775
Int. Cl.³ A61K *31/155, 31/195;* C07C *123/00*
U.S. Cl. 424—319 8 Claims

1. A compound of the structure



wherein R is H, lower alkyl or phenyl or phenyl substituted with a lower alkyl, lower alkoxy, halogen or a trifluoromethyl group, and R^1 is H, lower alkyl, halogen, carboxy, trifluoromethyl, lower alkyl, hydroxy, lower alkanoyl, or benzoyl or benzoyl substituted with a lower alkyl, lower alkoxy, halogen or a trifluoromethyl group, or acid-addition salts thereof.

7. An anti-inflammatory composition comprising a therapeutically effective amount of a compound as defined in claim 1 in a physiologically acceptable carrier therefor.

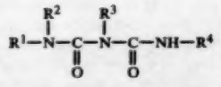
8. A method for treating an inflammatory condition in a mammalian host, which comprises administering an effective amount of the composition as defined in claim 7.

4,371,544
PHARMACEUTICAL COMPOSITION CONTAINING 1,1,3,5-SUBSTITUTED BIURET COMPOUND

Hajime Fujimura, Kyoto; Yasuzo Hiramatsu, Otsu; Takahiro Yabuuchi, Takarazuka; Masakatu Hisaki, Hikone; Katsuo Takikawa, Naruto; Takaji Honna, Tokushima; Hidekazu Miyake, Tokushima, and Makoto Kajitani, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Division of Ser. No. 134,555, Mar. 27, 1980, Pat. No. 4,278,672.
This application Apr. 24, 1981, Ser. No. 257,418
Claims priority, application Japan, Mar. 31, 1979, 54/38792; Mar. 31, 1979, 54/38794
Int. Cl.³ A61K *31/17*
U.S. Cl. 424—322 2 Claims

1. An analgesic, anti-inflammatory or anti-pyretic composition in the form of a tablet, capsule, granules, powder, injection preparation, suppository preparations, topical ointment or cream or per oral syrup, elixir or oily suspension containing as the active ingredient an effective amount of 1,1,3,5-substituted biuret compound of the formula (1),



(1)

wherein R^1 is a lower alkyl group or a phenyl group; R^2 is a lower alkyl group, a phenyl group or a substituted phenyl group having chlorine atom(s), methyl group(s) or methoxy group(s) as the substituent(s), further R^1 and R^2 may form a single ring containing one or two hetero atoms including the adjacent nitrogen atom; R^3 is a hydrogen atom, a lower alkyl group or a phenyl group; R^4 is a substituted phenyl group having at least one acetyl group as a substituent thereon; with a pharmaceutically acceptable carrier.

4,371,545
ISOPROPYL AMINE COMPOUNDS

Wilhelm Kunz, Wachtberg-Villiprott, and Klaus Gruber, Bonn, both of Fed. Rep. of Germany, assignors to Dolorgiet Beteiligungs GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 73,369, Sep. 7, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,823
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839475
Int. Cl.³ C07C *93/02;* A61K *31/135*
U.S. Cl. 424—330 3 Claims

1. The compound 1-(5-methyl-2-nitrophenoxy)-2-hydroxy-3-isopropylaminopropane or a physiologically acceptable salt thereof.

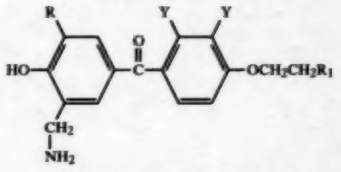
2. A pharmaceutical preparation comprising the compound according to claim 1 or a physiological salt thereof and a pharmaceutically acceptable carrier or diluent.

4,371,546
BENZOPHENONE DERIVATIVES

Jacob J. Plattner, Libertyville; Andre G. Pernet, Evanston, and Anthony K. Fung, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

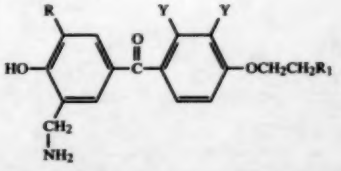
Filed Oct. 9, 1981, Ser. No. 310,165
Int. Cl.³ A61K *31/135;* C07C *97/10*
U.S. Cl. 424—330 15 Claims

1. A compound of the formula



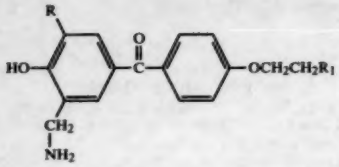
wherein R is hydrogen, loweralkyl, aminomethyl or halo, R_1 is hydroxy or NHX wherein X is hydrogen, loweralkyl, phenyl, acetyl, or benzyl, and Y may be the same or different and is hydrogen, loweralkyl, or halo, and pharmaceutically acceptable salts thereof.

6. A method of increasing the urinary excretion of a patient comprising administering to a patient in need of such treatment a therapeutically effective amount of a diuretic agent of the formula



wherein R is hydrogen, loweralkyl, aminomethyl or halo, R_1 is hydroxy or NHX wherein X is hydrogen, loweralkyl, phenyl, acetyl, or benzyl, and Y may be the same or different and is hydrogen, loweralkyl or halo, and pharmaceutically acceptable salts thereof.

11. A pharmaceutical composition useful as a diuretic which comprises a therapeutically effective amount of a compound of the formula



wherein R is hydrogen, loweralkyl, aminomethyl or halo, R_1 is hydroxy or NHX wherein X is hydrogen, loweralkyl, phenyl, acetyl, or benzyl, and Y may be the same or different and is hydrogen, loweralkyl, or halo, and pharmaceutically acceptable salts thereof, and a pharmaceutically acceptable carrier.

4,371,547

2-BENZYLIDENEGLUTARALDEHYDES USEFUL AS DISINFECTANTS

Wolfgang Münzenmaier, Wennigsen; Heinz Eggensperger, Hamburg; Helmut H. Ehlers, Hamburg; Wolfgang Beilfuss, Hamburg; Lothar Bücklers, Norderstedt, and Hans-Peter Harke, Hamburg, all of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

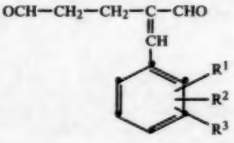
Filed Aug. 21, 1981, Ser. No. 294,890

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032794

Int. Cl.³ C07C *47/548;* A61K *31/11;* C07C *143/38, 143/44*

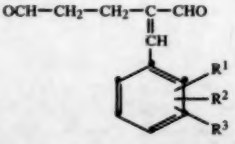
U.S. Cl. 424—333 **23 Claims**

1. A 2-benzylideneglutaraldehyde represented by the formula



where R^1, R^2 and R^3 independently are hydrogen or a substituent selected from the group consisting of halo, lower-alkyl, phenyl, carboxy, lower-alkoxycarbonyl, phenoxycarbonyl, aminocarbonyl, hydroxysulfonyl, nitro, cyano, hydroxy, lower-alkoxy and phenoxy.

17. A method for disinfecting an inanimate surface contaminated with deleterious microorganisms which comprises contacting said surface with an amount effective for disinfection thereof of a 2-benzylideneglutaraldehyde represented by the formula



where R^1, R^2 and R^3 independently are hydrogen or a substituent selected from the group consisting of halo, lower-alkyl, phenyl, carboxy, lower-alkoxycarbonyl, phenoxycarbonyl, aminocarbonyl, hydroxysulfonyl, nitro, cyano, hydroxy, lower-alkoxy and phenoxy.

4,371,548

DETERGENT-OIL BATH ADDITIVES

Claus Hermann, Baden-Baden, and Helmut Krings, Achern-Oensbach, both of Fed. Rep. of Germany, assignors to Lingner and Fischer GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1980, Ser. No. 188,066

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 7932944

Int. Cl.³ A61K *7/00*

U.S. Cl. 424—365 **9 Claims**

1. A homogeneous, detergent-oil skin-care bathing composition having foaming and oil-deposition properties, which comprises;

(i) from 20 to 70% by weight of the composition of a detergent blend consisting of:

(a) from 10 to 90% by weight of the blend of at least one amine C_{8-18} fatty alcohol sulphate optionally ethoxylated in the C_{8-18} fatty alcohol sulphate anion, and

(b) from 90 to 10% by weight of the blend of a metal ethoxylated C_{8-18} fatty alcohol sulphate or ammonium ethoxylated C_{8-18} fatty alcohol sulphate; and

(ii) from 20 to 60% by weight of the composition of a cosmetically acceptable oil.

4,371,549

STABLE LIQUID RED BEET COLOR AND CHEWING GUM CONTAINING SAME

Subraman R. Cherukuri; Dominick R. Friello, both of Danbury, Conn.; Ellery Parker, Johnstown, N.Y.; Walter Hopkins, Greenwich, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Nabisco Brands, Inc., New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,945

Int. Cl.³ A23G *3/30;* A23L *1/275*

U.S. Cl. 426—3 **8 Claims**

1. A stable liquid red beet color composition consisting essentially of spray-dried liquid red beet color, said spray-dried red beet color being deposited on particles of gum arabic or malto dextrin and dispersed in liquid medium which is an animal or vegetable food grade fatty acid or oil, propylene glycol or glycerine, in an amount such that said spray-dried liquid red beet color is present within the range of from about 30 to about 70% by weight and said liquid medium is present in an amount within the range from about 30 to 70% by weight based on the weight of said stable liquid red beet color composition.

4,371,550

PROCESS FOR BREWING BEER

Yoshiaki Nagashima, Mitaka; Yoshiomi Kimura, Yokohama, and Naoki Hashimoto, Takasaki, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,138

Claims priority, application Japan, Feb. 20, 1980, 55-19881

Int. Cl.³ C12C *9/00, 11/04*

U.S. Cl. 426—16 **7 Claims**

1. A beer brewing process which comprises mixing one part by volume of a high-gravity liquor comprising a fermenting wort of an original gravity of 14 to 21 degrees Plato which has passed through the high kraeusen period and two to five parts by volume of a low-gravity liquor comprising a fermenting wort or wort of an original gravity of 3 to 6 degrees Plato and subjecting the resulting mixture to fermentation thereby to obtain a beer of an original gravity of 6 to 9 degrees Plato, the wort to provide the high-gravity liquor and the low-gravity liquor being obtained from a mash comprising a mixture of malt and 0 to 50 percent of the weight of the malt of an adjunct on the basis of the two liquors after mixing thereof, and the total nitrogen content of the low-gravity liquor being at least 30 mg./100 g.

4,371,551
MALT-LIKE FLAVOR FROM CEREAL GRAIN ROOT CULTURES

Charles V. Fulger, Millwood; Gerhard J. Haas, Woodcliff Lake; Edwin B. Herman, Mohegan Lake, and Charles R. Lazarus, Ossining, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,804
Int. Cl.³ A23L *1/185*
U.S. Cl. 426—28 **7 Claims**

1. A process for the preparation of a composition possessing a malt-like flavor from buckwheat which comprises:
(a) germinating a buckwheat seed until sprouted roots develop therefrom;
(b) explanting said sprouted roots from the cereal grain seed and placing them onto a nutrient medium;
(c) culturing the roots until they have matured sufficiently by harvesting;
(d) harvesting the cultured roots prior to production of necrotic material; and
(e) heating the harvested cultured roots until a malt-like flavor is developed.

4,371,552
PRUNE JUICE PRODUCTION USING CELLULASE

Laurence H. Posorske, Bethel, Conn., assignor to Novo Industri A/S, Denmark

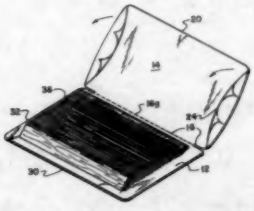
Continuation of Ser. No. 121,146, Feb. 13, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,322
Int. Cl.³ A23L *1/28, 2/04*
U.S. Cl. 426—50 **8 Claims**

1. A method for obtaining prune juice of viscosity 7–15 cps and exceeding 18.5° Brix which comprises cooking dried prunes until substantial disintegration of the prunes has taken place, then treating the cooked mixture with cellulase for ¼–6 hours at a concentration of 100 to 7500 units/kg prune slurry, and with pectinase at a concentration of 10 to 200 units/kg prune slurry and separating the prune juice from the solid prune waste.

4,371,553
PACKAGE INCLUDING PRODUCT SUPPORT INSERT

Donald A. Gilling, Neenah, Wis., and Albert G. McCaskill, Minneapolis, Minn., assignors to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed Aug. 1, 1980, Ser. No. 174,557
Int. Cl.³ B65D *85/62, 81/20, 77/24, 75/38*
U.S. Cl. 426—124 **7 Claims**

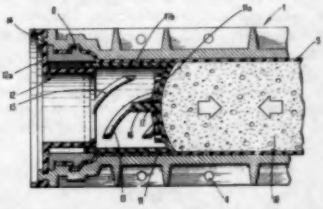


1. Paperboard and plastic film packaging including an element adapted to support and retain sliced product in a shingled array, and to facilitate substantially smooth disposition thereabout of the plastic film and subsequent sealing thereof to form a unitary film enclosure for said element and said product, said packaging comprising:
a supporting panel and a retaining panel, said supporting and retaining panels each being generally rectangular, having two longer sides and side edges defining the length of each panel and two shorter ends and end edges defining the width of each panel, and being joined together by a hinge line along common side edges, such that said retaining panel may be rotated about said hinge line and over said supporting panel;
said retaining panel having, on each end thereof, a transverse line of weak bending resistance extending in a continuous arc, from the vicinity of the intersections of said common side edge and said end edges, inwardly of said end edges, across the width of said retaining panel, to the adjoining intersection of the same respective end edges and the opposite side edge, said lines of weak bending resistance and their respective end edges defining cover flaps on the ends of said retaining panel;
each said cover flap having segmental lines of weak bending resistance extending from the corresponding end edge substantially to the corresponding transverse line of weak bending resistance and back to the corresponding end edge; and
said supporting panel having sides and ends corresponding to the sides and ends of said retaining panel respectively when said retaining panel overlies said supporting panel, and each said cover flap being bendable about said lines of weak bending resistance to engage the corresponding end of said retaining panel with the corresponding end of said support panel, said ends of said supporting panel being devoid of lines of weak bending resistance corresponding to both said transverse and said segmental lines of weak bending resistance on said cover flaps, wherein disposition of the plastic film wrapped about said packaging element and its supported and retained sliced product and subjection to evacuation and a sealing force is effective to urge said panels against said product and to collapse said cover flaps about said lines of weak bending resistance to urge the collapsed cover flaps against said product and the corresponding end of said supporting panel to provide a smooth surface of the collapsed cover flaps over which cover flaps the plastic film conforms.

4,371,554
METHOD OF MAKING SKINLESS SAUSAGE USING REUSABLE POROUS POLYTETRAFLUOROETHYLENE CASING

Heinz Becker, Zurich, Switzerland, assignor to Ashland Food Technology Holdings S.A., Luxembourg

Filed Oct. 27, 1980, Ser. No. 201,155
Claims priority, application Switzerland, Nov. 9, 1979, 10067/79
Int. Cl.³ A22C *11/00, 13/00*; A23L *1/31*
U.S. Cl. 426—243 **7 Claims**



1. A process for the production of caseless sausages, the process comprising the steps of inserting pliable, reusable porous casings into casing support structures, the pliable casings conforming to the internal cross-sectional shape of the support structures, the reusable tubular casings being formed of a vapor-permeable highly porous polytetrafluoroethylene membrane having a microstructure of nodes interconnected by fibrils, said membrane being heat stable, and non-adherent to bulk sausage; filling the reusable casings with unprocessed sausage material; reddening the sausage material to a desired

degree of redness by heating the filled casings; coagulating the bulk sausage material by continued heating of the sausage material, said reddening and coagulating steps including the concurrent steps of venting radially through the porous casing excess steam, water vapor, and other gaseous constituents released by the sausage material during said reddening and coagulating steps; ejecting the coagulated sausage material from the porous casings, the integrity of the membrane being maintained during said ejection step, and the external surface of the ejected sausage being smooth and its integrity being maintained during the ejection step; cleaning said reusable casings for subsequent refill with unprocessed sausage material; and refilling the reusable casings.

4,371,555

METHOD FOR DYEING EGGS

Paul R. Tully, 42 Windward Rd., Lowell, Mass. 01852

Filed Oct. 22, 1981, Ser. No. 313,834

Int. Cl.³ A23L *1/275, 1/321*

U.S. Cl. 426—250 **10 Claims**

1. A process for preparing a colored avian egg having a mottled decorative appearance which comprises:

applying a thin coating of a comestible oil onto the eggshell;

temporarily adhering a hydrophobic water-insoluble granular solid to the oil-coated eggshell;

dyeing the grain-coated egg by applying thereto an aqueous dyestuff; and

removing the temporarily adhered granular solid from the dyed egg.

4,371,556

SOY-CONTAINING DOG FOOD

Ezra Pitchon, Flushing, N.Y.; Robert E. Schara, Norwalk, Conn.; William P. Citarella, Port Chester, N.Y.; Joseph Giacone, Purdy's, N.Y., and Frederick A. Zobel, Bedford Hills, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,267

Int. Cl.³ A23K *1/18*

U.S. Cl. 426—311 **1 Claim**

1. In a process for preparing a soy-containing dog food wherein fat, protein, carbohydrate, vitamins and minerals are admixed in amounts effective to provide a nutritionally-balanced formulation and wherein the ingredients are mixed with sufficient water to provide a plastic mixture, which mixture is agitated under conditions of heat and pressure in a screw-fed extruder from a zone of high pressure to a zone of reduced pressure to effect expansion of the mixture, and then dried to a moisture content of less than 15% the improvement comprising, roasting whole soybeans at a temperature of from 100° C. to 130° C. and for a time effective to improve the palatability of a dog food which contains from 10 to 25% by weight of said roasted soy, surface coating the roasted soybeans with soybean oil in an amount of from 2 to 20% by weight of the beans, while the beans are still hot, grinding the heated oil-coated beans and thereafter admixing the ground soybeans with the remainder of the dog food formulation so that ground soybeans are present at a level of from 10 to 25% by weight of the dog food.

4,371,557

MAINTENANCE OF PROTEIN QUALITY IN FOODS CONTAINING REDUCING SUGARS

Maureen A. Oppy, Bourbonnais, and Dayle A. S. Nelson, New Lenox, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,671

Int. Cl.³ A23K *1/00, 1/10*

U.S. Cl. 426—321 **3 Claims**

1. An improved proteinaceous, nutritionally-balanced pet food composition containing a protein content of from 15 to 25% by weight, at least about 8% by weight reducing sugar and from 15% to 50% by weight of moisture, said reducing sugar and moisture being present in amounts normally susceptible to causing the loss of protein quality and further containing glycine or a soluble salt thereof in an amount of from about 0.25% to 1% by weight and effective to stabilize the protein quality.

4,371,558

SEMI-MOIST DOG FOOD PREPARATION

John A. Siregar, Reading, and John Arkoudilos, Allentown, both of Pa., assignors to Liggett Group Inc., Montvale, N.J.

Filed Feb. 11, 1981, Ser. No. 233,455

Int. Cl.³ A23K *1/10, 1/18*

U.S. Cl. 426—332 **7 Claims**

1. The process of preparing a cooked semi-moist pet food product comprising the steps of:

(a) admixing and cooking ground meat or meat by-products with water, propylene glycol, phosphoric acid and one or more acids selected from the group consisting of fumaric acid and succinic acid, said cooking step being carried out at a temperature in the range of between about 180° F. and 210° F. for times corresponding to about 30–10 minutes, and said cooked admixture being a substantially soupy consistency; and,

(b) further admixing and cooking therewith non-gellatinous water absorbent ingredients in sufficient proportion to render the admixture a free-flowing semi-moist relatively solid mass, and said cooling step being carried out at a temperature in the range of between about 180° F. and 210° F. for times corresponding to about 30–10 minutes;

and wherein the proportion of water in said product is between about 38% and 52% by weight.

4,371,559

PROCESS FOR LOWERING THE FREEZING POINT OF ANISE ESSENCES AND ANETHOLE BY NATURAL PRODUCTS

Max Voisin, 23, Rue Fourcroy, 75017 Paris, France

Filed May 21, 1981, Ser. No. 265,942

Claims priority, application Luxembourg, May 22, 1980, 82480

Int. Cl.³ A23L *1/22, 1/226*

U.S. Cl. 426—538 **4 Claims**

1. A process for lowering the freezing point of anise essense or anethole which comprises adding thereto an amount of an orange terpene, a limonene or mixture thereof sufficient to lower the freezing point of said anise essence or anethole to between about −4° and −6° C., said orange terpene, limonene or mixture thereof being soluble and miscible with said anise essence or anethole and an alcohol acceptable in foodstuffs and having been deodorized with activated vegetable carbon and dewaxed.

4,371,560

SEAFOOD PRODUCT AND METHOD OF PRODUCING SAME

Arthur Hochhauser, Allentown, Pa., and Richard B. Jackson, Brooklyn, N.Y., assignors to DCA Food Industries, New York, N.Y.

Continuation of Ser. No. 138,137, Apr. 7, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,388

Int. Cl.³ A22C *25/00, 29/02*

U.S. Cl. 426—643 **8 Claims**

1. A method of producing a seafood product which comprises the steps of providing pieces of a natural seafood, mechanically working the natural seafood pieces for a time and at an energy rate sufficient to at least partially break up muscle fiber present in the natural seafood pieces and to produce a coherent mass of protein as a homogeneous pulp, said mechanically working is carried out while applying a vacuum, said vacuum being in the range of 25 to 30 inches of mercury, and forming said pulp into a shaped product.

4,371,561

STEAROYL LACTYLATE SALT COMPOSITION HAVING IMPROVED PHYSICAL PROPERTIES AND METHOD OF PRODUCTION

Curtis J. Forsythe, Raytown, Mo., assignor to Top-Scor Products, Inc., Kansas City, Kans.

Continuation of Ser. No. 888,224, Mar. 20, 1978, Pat. No. 4,264,639. This application Feb. 9, 1981, Ser. No. 232,735

Int. Cl.³ A21D 2/16

U.S. Cl. 426—653 24 Claims

1. A composition of reduced hygroscopicity and increased melting point consisting essentially of:

(a) a stearoyl lactylate salt selected from the group consising of sodium stearoyl lactylate, calcium stearoyl lactylate, potassium stearoyl lactylate, and mixtures thereof and being within a range of about 98% to about 70% (by weight) of said composition; and

(b) an hydrogenated stearin within a range of about 2% to about 30% (by weight) of said composition; said stearin having an iodine value of less than about 7 and all fatty acid radicals on said stearin are in a range of about 50% to 100% (by weight of fatty acid) of at least C_{18} fatty acid; and wherein

(c) said stearin and said salt are mixed while said salt is in molten state.

14. A process for production of low hygroscopicity and high melting point stearoyl lactylate salt compositions consisting essentially of the steps of:

(a) manufacturing a stearoyl lactylate salt selected from the group consisting of sodium stearoyl lactylate, calcium stearoyl lactylate and mixtures thereof;

(b) adding hydrogenated stearin with an iodine value of less than about 7 to said salt, such that from about 2 to about 30 parts by weight of said stearin are added for each 70 to 98 parts by weight of said salt; wherein all fatty acid radicals on said stearin are in the range of 50% to 100% (by weight of fatty acid) of at least C_{18} fatty acid; and

(c) mixing together said stearin and said salt while said salt is in a molten state.

4,371,562

METHOD FOR IMPROVING THE FUNCTIONALITY OF PROTEIN MATERIALS

Herman H. Friedman, Forest Hills; Joseph Giacone, Purdy's; Charles J. Cante, Pleasantville, and John R. Frost, Beacon, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 85,183, Oct. 16, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,158

Int. Cl.³ A23K 1/00

U.S. Cl. 426—656 8 Claims

1. A method for improving the functionality of a protein material comprising the steps of:

(a) forming a non-solubilized, mixable, aqueous protein slurry composed of helical protein molecules, said slurry having greater than 20% solids concentration;

(b) mixing polyvinylpyrrolidone with said slurry, said mixing being effective to cause complete dispersion of said polyvinylpyrrolidone in said slurry;

(c) raising the pH of the slurry to within the alkaline range of from about 8 to about 14 and maintaining contact between the protein and the polyvinylpyrrolidone for a period of time effective to allow ingress of the polyvinylpyrrolidone internally in the helical protein molecules, and thereafter;

(d) reducing the pH of the slurry to the range of from about pH 5 to less than pH 8 in order to entrap a portion of the polyvinylpyrrolidone within the helical protein molecules.

4,371,563

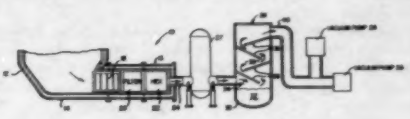
FINE PARTICLE FILTER SYSTEM HAVING LOW PRESSURE DROP FOR GASEOUS FLOW SYSTEMS

Erich Muehlberger, San Clemente, Calif., assignor to Electro-Plasma, Inc., Irvine, Calif.

Continuation of Ser. No. 134,526, Mar. 27, 1980, abandoned. This application Jun. 24, 1981, Ser. No. 277,020

Int. Cl.³ B05D 1/08

U.S. Cl. 427—34 15 Claims



1. The method of separating a fine particulate from a gaseous flow stream comprising the steps of:

providing a gaseous flow stream having a fine particulate;

directing the gaseous flow stream onto the surface of an oil bath at a supersonic speed and in an environment having a pressure no greater than 0.6 atmospheres to introduce oil vapor and droplets into the flow stream and at the same time deposit some of the fine particulate in the oil bath; and

directing the flow stream containing particulate and oil vapor and droplets through a tortuous path having multiple stagnation regions such that the oil wets surfaces of the multiple stagnation regions along the path and the particulate is adherent to the oil that wets the surfaces when impinging thereon.

4,371,564

PRODUCTION OF POROUS DIAPHRAGM FOR ELECTROLYTIC CELL

John F. Cairns, Frodsham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 19, 1981, Ser. No. 265,221

Claims priority, application United Kingdom, May 30, 1980, 8017687

Int. Cl.³ B05D 3/06

U.S. Cl. 427—35 14 Claims

1. A process for the production of a porous diaphragm suitable for use in an electrolytic cell characterised in that the process comprises irradiating a porous shaped article of an organic polymeric material with high energy radiation, the irradiation being effected in the presence of, or the irradiated shaped article being subsequently contacted with, a reactant selected from ammonia, carbon monoxide or phosgene.

4,371,565

PROCESS FOR ADHERING AN ORGANIC RESIN TO A SUBSTRATE BY MEANS OF PLASMA POLYMERIZED PHOSPHINES

Arnold I. Baise, Poughkeepsie, N.Y.; John M. Burns, Menlo Park, Calif., and Harbans S. Sachdev, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,273

Int. Cl.³ B05D 3/06

U.S. Cl. 427—41 5 Claims

1. A process for increasing the adhesion of an organic resin material to a metal or silicon containing substrate, said process comprising the steps of:

(1) providing a vapor of an unsaturated organophosphine,

(2) introducing said organophosphine vapor into a reaction chamber,

(3) subjecting said organophosphine vapor to radio energy discharge, so as to deposit a film of polymerized organophosphine on said substrate, and

(4) applying a coating of an organic resin on top of said film of polymerized organophosphine.

4,371,566

ABRASION RESISTANT COATING COMPOSITION

Raymond J. Russell, Lincoln Park, N.J., assignor to Panelgraphic Corporation, West Caldwell, N.J.

Filed Sep. 10, 1980, Ser. No. 185,670
Int. Cl.[3] B05D *3/06*
U.S. Cl. 427—53.1 73 Claims

1. A composition curable by actinic radiation to form an abrasion-resistant product comprising a pentaerythritol-based polyacrylate or polymethacrylate, a vinyl chloride-vinyl acetate containing polymer and a photoinitiator, wherein the weight ratio of said polyacrylate or polymethacrylate to said vinyl chloride-vinyl acetate containing polymer is from about 5 to 1 to about 20 to 1.

38. A method of providing an abrasion resistant coating on a substrate comprising:

(a) forming a composition curable by actinic radiation comprising a pentaerythritol-based polyacrylate or polymethacrylate, a vinyl chloride-vinyl acetate containing polymer and a photoinitiator wherein the weight ratio of said pentaerythritol-based polyacrylate or polymethacrylate to said vinyl chloride-vinyl acetate containing polymer is formed about 5 to 1 to about 20 to 1;

(b) applying said composition to said substrate; and

(c) irradiating said composition with actinic radiation to effect curing thereof.

4,371,567

HIGH COERCIVITY, COBALT-DOPED FERRIMAGNETIC IRON OXIDE PARTICULATES

Alex Chamard, La Courneuve; Patrick Dougier, Andresy, and Jean-Bruno Monteil, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 7, 1981, Ser. No. 251,770
Claims priority, application France, Apr. 28, 1980, 80 09498
Int. Cl.[3] C01G *49/02*
U.S. Cl. 427—130 8 Claims

1. A process for the preparation of high coercivity, cobalt-doped ferrimagnetic iron oxide particulates, said particulates comprising ferrous iron, and which process comprises (i) thermally decomposing a β-diketone complex of cobalt having a decomposition temperature in the range of 300° to 500° C., and a sublimation point therebelow, onto fluidized iron oxide particles having the formula $(FeO)_xFe_2O_3$, wherein $0 \leqslant x \leqslant 1.5$, (ii) next, in an inert atmosphere, annealing the particulates which result at a temperature ranging from about 300° to 500° C. and then (iii) permitting the same to cool, while at the same time sweeping the cooling zone with an inert gas, and thence (iv) controllably re-oxidizing the annealed, cooled particles to effect formation of cobalt ferrite thereon, the cobalt being present in the form of Co^{+2}.

4,371,568

METHOD AND MEANS TO FILL OUT UNEVEN SURFACES, FOR EXAMPLE IN BLOCK BOARDS

Björn R. L. von Tell, Bergstigen 14, S-138 00 Älta, Sweden

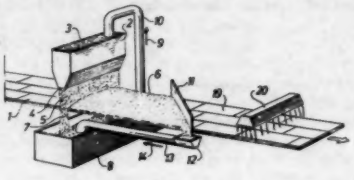
Filed May 14, 1981, Ser. No. 263,771
Claims priority, application Sweden, May 23, 1980, 8003880
Int. Cl.[3] B32B *35/00;* B05D *3/02, 3/12, 1/02*
U.S. Cl. 427—140 11 Claims

1. A method of filling cavities in an uneven surface of a wooden article to smooth said surface, which comprises the steps of

(a) applying a curtain of a fusible powder to said surface from an applicator in an amount in excess of the amount required to fill the cavities while vibrating the applicator at a relatively high frequency and subjecting the wooden article to vibration at a relatively low frequency,

(b) scraping the excess amount of the fusible powder from the surface to remove said excess amount of powder therefrom,

(c) supplying heat to the fusible powder remaining in the cavities until the powder has melted therein to form a molten filling thereof, and



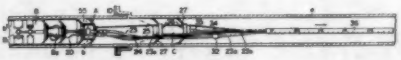
(d) discontinuing the supply of heat and permitting the molten filling to harden in the cavities whereby the cavities are permanently filled.

4,371,569

METHOD FOR REINFORCING AND REPAIRING PIPING

Natsuo Muta, Fukuoka-Ken, and Toshihisa Kanamaru, Fukuoka-Ken, both of Japan, assignors to Saibu Gas Co. Ltd. and Kabushiki Kaisha Kankyo Kaihatsu, both of Fukuoka, Japan

Division of Ser. No. 125,772, Feb. 29, 1980, Pat. No. 4,308,824.
This application Sep. 29, 1981, Ser. No. 306,753
Claims priority, application Japan, Nov. 22, 1979, 54-151727
Int. Cl.[3] B05L *7/08;* B05D *1/26*
U.S. Cl. 427—230 3 Claims



1. A method for reinforcing and repairing a pipe line, using a film forming device, a film adjusting device, and means for inspecting the inner surface of the pipe line, said method comprising:

(a) inserting said film forming device, said inspecting means, and said film adjusting device into a pipe line in spaced-apart relation;

(b) moving said film forming device, said pipe line inspecting device, and said film adjusting device through said pipe line along a predetermined direction of movement, whereby said inspecting means are disposed forwardly of said film forming means and said film adjusting means, as viewed in said direction of movement, said inspecting means thereby having a viewing angle directed rearwardly towards said film forming means;

(c) applying said film forming material to the inner surface of said pipe line;

(d) inspecting said inner surface to locate possible leakage portions of said pipe line while moving said devices by directing said inspection means rearwardly with respect to said direction of movement;

(e) stopping all of said devices when said film forming device is positioned adjacent one of said portions; and

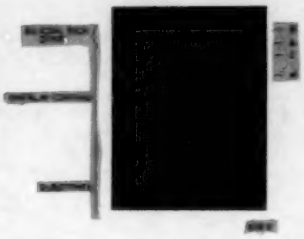
(f) applying said material to said area to completely and securely seal such portions while said devices are stopped.

4,371,570

HOT CORROSION RESISTANT COATINGS

Joseph A. Goebel, Rocky Hill; Richard H. Barkalow, and Nicholas E. Ulion, both of Marlborough, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 120,248, Feb. 11, 1980, Pat. No. 4,326,011.
This application Feb. 1, 1982, Ser. No. 344,412
Int. Cl.³ C23C 11/00
U.S. Cl. 427—248.1 4 Claims



1. A method for providing a superalloy article with enhanced resistance to hot corrosion including the steps of:

a. providing the article with an overlay coating of a material selected from the group consisting of MCr, MCrAl, MCrAlY and MCrAlHf, where "M" is selected from the group consisting of Fe, Ni, Co, and mixtures thereof:

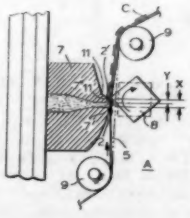
b. diffusing silicon into the overlay coating surface to produce a silicon rich surface zone having a thickness of from about 10 to about 40% of the total coating thickness which contains from about 20 to about 40% Si.

4,371,571

WIDE-BAND AND CONTINUOUS LINE ADHESIVE APPLICATOR AND METHOD FOR CIGARETTE FILTER ATTACHMENT AND THE LIKE

Donald B. McIntyre, and Frederic S. McIntyre, both of Wellesley, Mass., assignors to Acumeter Laboratories, Inc., Marlborough, Mass.

Division of Ser. No. 69,973, Aug. 27, 1979, Pat. No. 4,277,301.
This application Oct. 20, 1980, Ser. No. 198,614
Int. Cl.³ B05D 1/42, 5/10
U.S. Cl. 427—285 3 Claims



1. A method of fluid adhesive application, that comprises, extruding at a predetermined region a plurality of in-line closely spaced parallel beads of such adhesive transversely onto a web as the web is longitudinally drawn through said region; moving the extruded beads on the web to a shear edge spaced longitudinally from said region; periodically bumping the beads of said parallel-bead-coated web against said edge; and controlling the size of the beads and location of bumping relative to the speed of drawing of the web to cause the beads at said edge to spread into longitudinally intermittent bands of adhesive ranging from bands of parallel stripes to merged-uniform continuous coating bands.

4,371,572

PROCESS FOR THE TREATMENT OF WOOD

Bror O. Hager, Forsetevagen 5, S-182 63 Djursholm, Sweden

Filed Feb. 18, 1981, Ser. No. 235,753
Claims priority, application Sweden, Oct. 10, 1979, 7908379
Int. Cl.³ B05D 3/00, 3/02, 3/12
U.S. Cl. 427—298 11 Claims

1. In a process for the coloring of untreated wood wherein said wood is contacted with a heated pigment-containing drying/coloring oil, the improvement comprising providing untreated wood wherein at least the outer surface layer of the wood has a moisture content in excess of the fiber saturation point of the wood and contacting the wood with a heated pigment-containing drying/coloring oil under temperature and pressure conditions sufficient to remove at least a portion of the moisture from said wood and cause said wood to become pigmented, said contacting being conducted for a period of time sufficient for the moisture content of all parts of said outer surface layer of the wood to decrease below the fiber saturation point of the wood; and removing the treated wood from contact with said oil.

2. The process of claim 1 wherein said contacting step occurs under a vacuum.

4,371,573

ELECTROLESS DEPOSITION OF NICKEL COATINGS AND DEPOSITING BATHS THEREFOR

Herbert Januschkowetz, and Hans Laub, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,547
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049417
Int. Cl.³ C23C 3/02
U.S. Cl. 427—438 5 Claims

1. A depositing bath for the electroless deposition of nickel on surfaces of metal and metal alloys comprising an aqueous solution containing (a) from about 10 to about 50 g/l of a flourine-containing nickel compound; (b) from about 40 to about 200 g/l diammonium hydrogen citrate; (c) from about 20 to about 100 g/l ammonium hydrogen difluoride; (d) from about 5 to about 50 g/l 2-hydroxy-4-methyl-benzoic acid; (e) from about 0.0005 to about 0.05 g/l copper salt; and (f) from about 10 to about 100 g/l sodium hypophosphite.

4,371,574

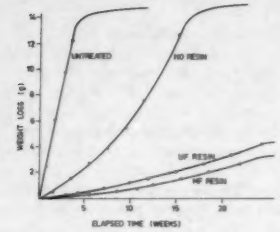
ENCLOSURE MEMBER SUBSTANTIALLY IMPERMEABLE TO THE TRANSMISSION OF SOLVENTS AND FUELS

Roger A. Shefford, Aldershot, Great Britain, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Dec. 5, 1980, Ser. No. 213,668
Claims priority, application United Kingdom, Feb. 12, 1980, 8004570
Int. Cl.³ B65D 23/00; B05D 3/00
U.S. Cl. 428—35 5 Claims

1. An enclosure member consisting essentially of solid, non-aromatic polymers that have a linear carbon to carbon backbone structure and have a plurality of free hydrogen atoms attached to the carbon atoms with a permeability to wet solvents and fuels of less than 1/50 of the permeability of untreated enclosure members having a thickness of 1 mm, the enclosure having an inner and outer surface, at least the inner surface having a portion of the hydrogen atoms replaced by

sulphonic acid or sulphonate groups and being coated with a cured layer having a thickness of from 2 to 50 micrometers of



condensation products selected from the group consisting of formaldehyde and melamine or formaldehyde and urea.

4,371,575

RIGID, ONE-PIECE, BIAXIALLY STRETCHED SHAPED BODY OF SYNTHETIC RESIN AND METHOD FOR MAKING THE SAME

Klaus Kerk, Griesheim; Dieter Mueller, Pfungstadt, and Bernd Oleiko, Duisberg-Baerl, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

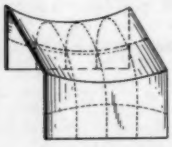
PCT No. PCT/EP80/00125, § 371 Date May 18, 1981, § 102(e) Date May 18, 1981, PCT Pub. No. WO81/01304, PCT Pub. Date May 14, 1981

PCT Filed Nov. 4, 1980, Ser. No. 264,300

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, 7931201[U]

Int. Cl.³ B29C *17/04, 25/00*

U.S. Cl. 428—81 **8 Claims**



1. A method for making a rigid one-piece shaped body of biaxially stretched synthetic resin in the form of a sheet having a thickness of at least 1 millimeter, said body having an edge which does not lie in one plane and having a surface smaller than the imagined flat initial surface enclosed by said edge, which method comprises deforming a sheet of biaxially stretched synthetic resin at least 1 millimeter thick by elastic bending at a temperature below the softening point of the resin into a configuration in which the edge of the sheet does not lie in a single plane, rigidly fixing the edge of the sheet, and heating said sheet without touching the surface thereof and with equal gas pressure on both sides of the sheet until said synthetic resin is in the thermoelastic state, whereby the surface of the sheet enclosed by the edge shrinks back partially but shrinkage of the edge of the sheet is not permitted, and subsequently cooling the sheet below the softening temperature of the synthetic resin.

4,371,576

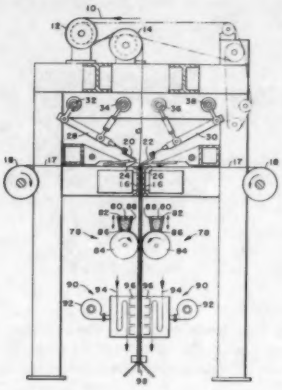
HOT MELT ADHESIVE BONDED PILE FABRICS

Greville Machell, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 22, 1981, Ser. No. 304,486

Int. Cl.³ D04H *11/08*

U.S. Cl. 428—92 **5 Claims**



1. A hot melt adhesive bonded pile fabric which comprises a liquid-permeable base layer, a pile forming yarn adjacent to but not tufted through the base layer in pile forming fashion, the pile forming yarn having been bonded to the base layer by means of a hot melt adhesive applied to the back of said base layer and forced through the base layer into contact with said pile forming yarn.

4,371,577

ANTIMICROBIAL CARPET CONTAINING AMINO ACID TYPE SURFACTANT

Minoru Sato, Gifu; Yoshiteru Hirose, Kamakura, and Shigeshi Toyoshima, Funabashi, all of Japan, assignors to Mitsubishi Burlington Co., Ltd.; Ajinomoto Co., Ltd. and Mitsui & Co., Ltd., all of Tokyo, Japan

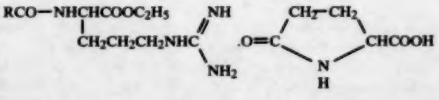
Filed Apr. 27, 1982, Ser. No. 372,139

Claims priority, application Japan, May 22, 1981, 56-76755

Int. Cl.³ B32B *3/02, 33/00*

U.S. Cl. 428—96 **11 Claims**

1. An antimicrobial carpet, comprising an amino acid type surfactant represented by the formula:

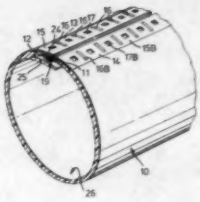


wherein RCO is a C_8–C_{16} fatty acid residue, attached on a fibrous material constituting said carpet.

4,371,578
HEAT SHRINKABLE MATERIAL FOR WRAPPING AROUND A PIPE, CABLE OR THE LIKE

Roy F. Thompson, Farnborough Park, England, assignor to A. C. Egerton Limited, Kent, England

Filed Jul. 25, 1980, Ser. No. 172,457
Claims priority, application United Kingdom, Jul. 27, 1979, 7926219; Dec. 7, 1979, 7942237; May 2, 1980, 8014718
Int. Cl.³ B32B 3/02; F16L 55/16
U.S. Cl. 428—192 14 Claims

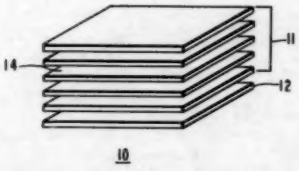


1. Material for wrapping around a pipe, cable or the like, comprising a flexible sheet of material, first and second opposite edges of said material, said material being heat-shrinkable in a direction between first and second opposite edges, a first clip element secured on said first edge and a second clip element secured on said second edge, the first and second clip elements each comprising a body portion secured to the flexible sheet and a hook member extending from said body portion away from the associated edge, the hook members of the two clip elements being bent in opposite senses and being inclined towards the associated body portion, whereby the hook elements are inter-engageable to hold said first and second edges in proximity and means to maintain said clip elements in inter-engagement.

4,371,579
FIRE-RESISTANT FILLER SHEET LAMINATES

Harold O. McCaskey, Allendale, and Melvin E. Benson, Varnville, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 9, 1980, Ser. No. 195,550
Int. Cl.³ B32B 5/16, 5/28, 5/30
U.S. Cl. 428—204 7 Claims



10

1. A fire-resistant laminate comprising a plurality of thermoset resin impregnated filler sheets, the filler sheets before resin impregnation consisting of from about 60 wt. % to about 90 wt. % inorganic filler selected from the group consisting of aluminum trihydrate, magnesium silicate, magnesium hydroxide, magnesium carbonate, calcium silicate, calcium carbonate, mica, silica, and mixtures thereof, from about 5% up to about 25 wt. % cellulose fibers and from about 0.5 wt. % to about 20 wt. % resinous binder, the plurality of thermoset resin impregnated filler sheets being heat and pressure consolidated and bonded together into a unitary member, and having a resin ratio of from about 1.20 to about 4.0.

4,371,580
THREE-PLY BELTING MATERIAL

Donald Morrison, Harper, and William T. Muma, Jr., Anthony, both of Kans., assignors to Morrison Company, Inc., Anthony, Kans.

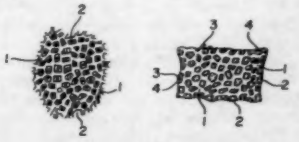
Filed Jan. 26, 1982, Ser. No. 342,812
Int. Cl.³ B32B 7/00
U.S. Cl. 428—250 13 Claims

1. Three-ply belting material, comprising:
a center ply comprising a first synthetic fabric;
first and second outer plies which are disposed in spaced relationship to the center ply on opposite sides of the center ply, each outer ply comprising a second synthetic fabric, the second synthetic fabric having a flex fatigue life and a modulus which are respectively greater than the flex fatigue life and modulus of the first synthetic fabric;
a first rubber skim, which is interposed between the center ply and the first outer ply and which is bonded to the center ply and the first outer ply;
a second rubber skim which is interposed between the center ply and the second outer ply and which is bonded to the center ply and the second outer ply, the thicknesses of the first and second rubber skims being substantially the same; and
first and second rubber covers which are bonded to the first and second outer plies, respectively.

4,371,581
SOUND ABSORBER

Fusaoki Uchikawa, Kamakura; Hideharu Tanaka; Mutsuo Sekiya, both of Amagasaki, and Yasufumi Ohata, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,519
Claims priority, application Japan, Mar. 17, 1981, 56-41386; Mar. 24, 1981, 56-43455
Int. Cl.³ B32B 5/16
U.S. Cl. 428—304.4 9 Claims



1. A sound absorber which comprises a layer of a composition of a heat resistant binder and a low temperature oxidizing catalyst which is coated on a porous metal substrate in the hardened form.

4,371,582

INK JET RECORDING SHEET

Masatoshi Sugiyama; Ichiro Nakanishi; Akira Ogawa, all of Minami-ashigara, and Masakazu Maekawa, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 12, 1981, Ser. No. 292,068
Claims priority, application Japan, Aug. 14, 1980, 55/112083
Int. Cl.³ B32B *27/10;* G01D *15/34*
U.S. Cl. 428—341 13 Claims

1. An ink jet recording sheet for forming a recorded image by jetting thereonto an aqueous ink containing as a water-soluble dye a direct dye or acid dye having an anionic dissociable group, comprising at least one water insoluble basic latex polymer incorporated in or on a base support.

8. An ink jet recording sheet as in claim 1, 2, or 3, wherein the content of the water insoluble basic latex polymer is from 0.1 to 20 g/m^2 of the support.

4,371,583

MODIFIED IONOMER BLEND AND LAMINATED ARTICLE

Wayne F. Nelson, Akron, Ohio, assignor to A. Schulman, Inc., Akron, Ohio

Filed May 4, 1981, Ser. No. 260,180
Int. Cl.³ B32B *15/08, 27/20, 27/28*
U.S. Cl. 428—358 10 Claims

1. A metal trim having a tough, non-glossy adherent coating comprised of a modified ionomer blend of (1) about 20 to 60 percent of an ethylene-propylene rubber, in which ethylene is the predominant component, (2) about 40 to 80 percent of a copolymer containing ethylene units and carboxylic acid containing units, said copolymer containing between about 25 and 98.5 percent ethylene units and between about 1.5 and 30 percent carboxylic acid containing units, and said carboxylic acid units being from 10 to 100 percent neutralized with metallic ions, and (3) an effective amount up to about 10 percent of an ultraviolet stabilizing coloring material selected from the group consisting of

(1) carbon black, and

(2) a pigment plus an ultraviolet stabilizer, with or without an antioxidant, said coating and said trim having substantial area of flat surface-to-surface contact and said coating being adhered thereto by the inherent adhesive character of said blend.

4,371,584

AQUEOUS TREATING COMPOSITION FOR GLASS FIBER YARNS AND TREATED YARNS

Dennis M. Fahey, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 212,913
Int. Cl.³ B32B *9/00;* D02G *3/00*
U.S. Cl. 428—392 11 Claims

1. Bulked glass fiber strand yarn, wherein the glass fiber strands have the dried residue of a film former and lubricant, where the yarn additionally has the dried residue of an aqueous treating composition, comprising:

a. solid, thermoplastic, alkali soluble, carboxylated, polymer selected from acrylics, polyesters, polyvinylacetates, polyvinylesters, and their copolymers and styrene butadiene, where the polymers and copolymers have carboxylation in an amount at least about 3 weight percent of the polymer and copolymer and where the polymer and copolymer is present in the aqueous composition in an amount in the range of about 1 to about 15 weight percent of the aqueous treating composition,

b. plasticizing material selected from internal, external and polymeric plasticizers in an amount in the range of about 0 to 10 weight percent of the aqueous treating composition,

c. alkali material selected from ammonia, alkali metal and alkaline earth metal hydroxides, amides and amines in an amount to give a pH of the aqueous treating composition in the range of about 7 to about 10 to solubilize the alkali soluble thermoplastic polymer,

d. liquid lubricating materials selected from the group consisting of polyalkylene polyols, polyalkoxylated fatty acids, polyalkoxylated fatty acid esters and mixtures thereof having a viscosity of at least 100 centistokes present in an amount in the range of about 0.5 to about 4 weight percent of the aqueous treating composition, and

e. water in an amount to give a percent total solids for the composition in the range of about 1 to about 25 weight percent.

4,371,585

PROCESS FOR APPLYING A SILICONE OR SILOXANE-BASED ABRASION RESISTANT COATING TO A POLYCARBONATE SUBSTRATE, AND COATED ARTICLES

Nazir A. Memon, Fallsington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 822,763, Aug. 8, 1977, abandoned. This application Aug. 13, 1979, Ser. No. 65,795
Int. Cl.³ A02B *1/10, 1/04;* B05B *1/38;* B32B *27/08*
U.S. Cl. 428—412 4 Claims

1. A process for applying and adhering a silicone or siloxane based abrasion-resistant coating to a polycarbonate substrate comprising applying a tie coating composition comprising a thermoplastic polymer of an alkyl methacrylate or a thermoplastic copolymer polymerized from a monomer mixture consisting essentially of at least 50 weight percent of at least one alkyl methacrylate or a mixture of such polymers and a flow improver dissolved in one or more organic solvents and drying at a temperature of about 20° to 30° C. prior to applying said abrasion-resistant coating.

4,371,586

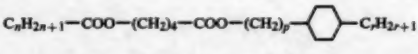
PLASTICIZERS FOR POLYVINYL BUTYRAL

Daniel Dages, Les Mureaux, France, assignor to Saint-Gobain Vitrage, Neuilly sur Seine, France

Filed Aug. 19, 1981, Ser. No. 294,415
Claims priority, application France, Sep. 1, 1980, 80 18862
Int. Cl.³ B32B *17/10, 27/42*
U.S. Cl. 428—437 19 Claims

1. A method for plasticizing polyvinyl butyral which comprises admixing polyvinyl butyral with a plasticizer mixture of:

(a) at least one alkyl alkylaryl adipate having the general formula:



wherein n is greater than or equal to 1 and the sum of p+r is greater than or equal to 1; and

(b) at least one dialkyl adipate in which the alkyl group contains from 3 to 8 carbon atoms,

wherein the alkyl alkylaryl adipate comprises between about 50 and 80% by weight of the total plasticizer mixture.

4,371,587

LOW TEMPERATURE PROCESS FOR DEPOSITING OXIDE LAYERS BY PHOTOCHEMICAL VAPOR DEPOSITION

John W. Peters, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

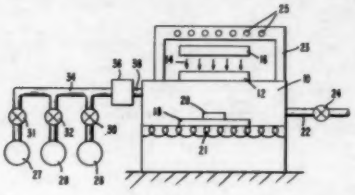
Continuation of Ser. No. 104,323, Dec. 17, 1979, abandoned. This application Mar. 26, 1981, Ser. No. 247,571
Int. Cl.³ B32B *9/04, 13/04*
U.S. Cl. 428—446 39 Claims

6. A process for depositing a layer of an oxide of a chosen

material on the surface of a selected substrate by chemical vapor deposition comprising the steps of:

(a) providing said substrate; and

(b) exposing said substrate to a selected vapor phase reactant in the presence of photochemically generated neutral oxygen atoms, said neutral oxygen atoms being formed by the mercury photosensitized dissociation of a chosen



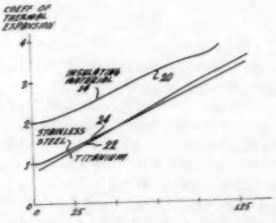
chemically unreactive oxygen-containing precursor, whereby said neutral oxygen atoms react with said vapor phase reactant to form said oxide which deposits as said layer on said substrate and said neutral oxygen atoms are formed in a manner which avoids damage to said substrate due to charge bombardment or radiation bombardment of said substrate.

4,371,588

ELECTRICAL INSULATING MATERIAL WITH HERMETIC SEAL

James C. Kyle, 24372 Via San Clemente, Mission Viejo, Calif. 92692

Filed Dec. 8, 1980, Ser. No. 214,256
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—448 **22 Claims**



1. In combination for providing a hermetic seal,

a member made from a material selected from titanium alloys, titanium, Inconel and stainless steel in the 300 series and having a coefficient of thermal expansion which changes at a particular rate with changes in temperature from ambient temperatures to a temperature of approximately 1500° F.,

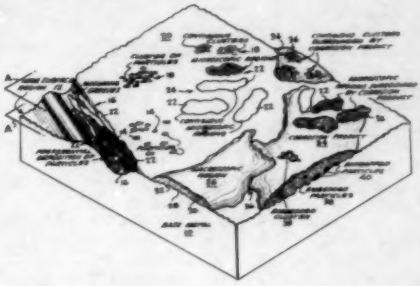
a ceramic material hermetically sealed to the member throughout the range of temperatures between ambient temperatures and temperatures of approximately 1500° F. and having insulating properties throughout the range of temperatures between ambient temperatures and temperatures of approximately 1500° F. and having a coefficient of thermal expansion which changes throughout an extended range of temperatures from ambient temperatures to a temperature of approximately 1500° F. at a rate substantially corresponding to the changes in the coefficient of thermal expansion of the member throughout such range.

4,371,589

PROCESS FOR DEPOSITING PROTECTIVE COATING AND ARTICLES PRODUCED

Joshua B. Warner, Spartanburg, and James S. Wolf, Clemson, both of S.C., assignors to Warner Lendon Inc., Spartanburg, S.C.

Continuation of Ser. No. 717,394, Aug. 24, 1976, abandoned. This application Apr. 20, 1979, Ser. No. 31,797
Int. Cl.³ B22F *7/04*
U.S. Cl. 428—553 **30 Claims**



1. An article of relatively low wear-resistant base metal coated with a refractory metal comprising:

a base metal of relatively low wear resistance,

a near-surface region of said base metal,

a refractory metal having a melting point of at least 1490° C. deposited within said near-surface region and being adherent to said base metal,

said refractory metal being deposited as discrete particles,

a plurality of said particles being contiguous to form clusters and,

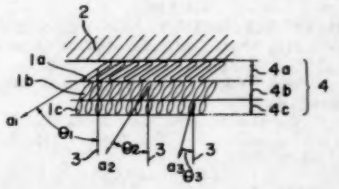
said clusters of said particles of refractory metal being spaced from each other to form an adherent wear-resistant discontinuous coating of said discrete particles of refractory metal on said base metal.

4,371,590

MAGNETIC RECORDING MEDIUM WITH STEPWISE ORIENTATION OF DEPOSITED METALLIC PARTICLES

Toshiaki Izumi; Seitoku Saito; Fumio Maruta, and Minoru Kameya, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,357
Claims priority, application Japan, Mar. 25, 1980, 55-38585
Int. Cl.³ B32B *15/18*; H01F *1/16*
U.S. Cl. 428—555 **5 Claims**



1. A magnetic recording medium comprising two or more thin metallic layers on a substrate, said layers having deposited thereon metallic particles whose angle of orientation varies stepwise between said layers to provide a substantially constant coercive force while residual magnetic flux increases in substantial proportion to the number of said thin metallic layers.

4,371,591

MANIFOLD VENTED BATTERY COVER

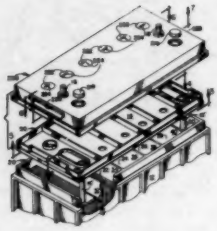
Terry R. Oxenreider, Wernersville, and Herbert A. Bush, Jr., Kenhorst, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 146,577, May 5, 1980, Pat. No. 4,278,742. This application Dec. 29, 1980, Ser. No. 221,088

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ H01M 2/12

U.S. Cl. 429—88 **3 Claims**



1. A manifold cover for use with a battery case having upstanding partitions forming a plurality of cell compartments and an equal plurality of plate packets one in each of said cell compartments to provide a lead acid storage battery, said manifold cover comprising:

an inner member for engaging said battery case and said upstanding partitions to define a plurality of substantially closed cells, each of said cells having a vent port which depends from said inner member into said cell,

electrical terminals, each of said terminals comprising a male portion, an intermediate portion and a female portion, said female portion dimensioned to receive a terminal post normally associated with the end cell battery plate packets, and

an outer member dimensioned to fit over and about said inner member and assembled thereto to define a manifold portion therebetween, said outer member having an electrolyte fill port for each of the respective cells, said electrolyte fill port extending from the upper surface of said outer member through said manifold portion and said lower member and into said cell, said outer member having one of said electrical terminals positioned at each of the end cells of said battery case, said male portion of said terminal extending through said outer member, said intermediate portion of said terminal and said female portions positioned within said manifold portion.

4,371,592

PRIMARY CELL OF HIGH ENERGY DENSITY IN WHICH THE ANODE ACTIVE MATERIAL IS AN ALKALI METAL

Jean-Paul Gabano, Poitiers, France, assignor to Gipelec, Levallois-Perret, France

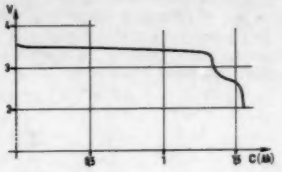
Filed Mar. 16, 1981, Ser. No. 243,796

Claims priority, application France, Mar. 28, 1980, 80 07077; Dec. 30, 1980, 80 27802

Int. Cl.³ H01M 4/58

U.S. Cl. 429—91 **9 Claims**

1. A cell of high specific energy in which the anode active material is an alkali metal and the cathode active material is sulphur oxychloride which simultaneously acts as an electrolyte solvent, said electrolyte further containing a dissolved salt and a co-solvent whose reduction potential relative to said alkali metal is less than the reduction potential of sulphur dioxide, wherein the proportions (by volume) of the co-solvent relative to the solvent and co-solvent mixture lie between 32% and 43%, so as to obtain, in the discharge curves (voltage as a function of the discharge capacity) a second perceptible discharge plateau at the level of the reduction potential of sulphur dioxide.



4,371,593

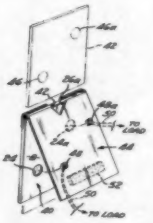
PRESSURE ENERGIZED PORTABLE POWER SOURCE, AND APPARATUS INCORPORATING SAME

Carol Ramey, 6536 Vista Del Mar, Playa del Rey, Calif. 90291

Filed May 29, 1981, Ser. No. 268,277

Int. Cl.³ H01M 2/10

U.S. Cl. 429—97 **15 Claims**



1. In combination, a battery holder and pressure-sensitive switch plate which comprises:

a battery holder formed from an initially flat, thin, flexibly resilient, unitary sheet of electrically non-conductive material, provided with a first set of foldline means which when bent along said fold lines in a predetermined manner and affixed in place, forms said battery holder;

a flexibly resilient tab member, formed from said initially flat, thin, unitary sheet of non-conductive material, and integrally affixed to said battery holder;

a second foldline means, said tab member when bent about said second foldline means in a predetermined manner, forming an integrally hinged, flexibly resilient, switch plate;

a third electrical interconnection means provided in said unitary sheet defining said battery holder, said third means permiting electrically interconnection of the positive and negative terminals of a battery adapted to be mounted within said battery holder; and

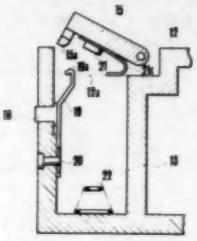
electrically conductive terminal means provided on said integrally hinged switch plate, said terminal means being adapted to electrically contact at least one of said positive and negative terminals of the said battery when said switch plate and said battery holder are placed under relative compressive force, the said electrically conductive terminal means on said integrally hinged switch plate being normally spaced from at least one of said positive and negative terminals of said battery.

4,371,594

BATTERY ACCOMMODATING DEVICE

Tsunemasa Ohara, Tokyo, and Masayoshi Yamamichi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,770
Claims priority, application Japan, Oct. 3, 1980, 55-141809[U]; Oct. 3, 1980, 55-141810[U]
Int. Cl.³ H01M 2/10
U.S. Cl. 429—97 5 Claims



1. In a battery accommodating device having a chamber in which a plurality of cylindrical batteries are positioned in side-by-side relation to each other and a cover pivotally supported and arranged to close an opening portion of said chamber, the improvement comprising:

(a) a lock member for locking said cover in the closed position, said lock member being provided in a space surrounded by the side walls of the cylindrical batteries when loaded in said chamber and an inside wall of said chamber; and

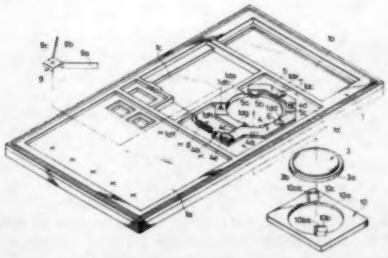
(b) an operating member for operating said lock member from the outside of said battery chamber.

4,371,595

BATTERY CONTAINING MECHANISM OF A COMPACT ELECTRONIC INSTRUMENT

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 330,016
Claims priority, application Japan, Dec. 19, 1980, 55/180237
Int. Cl.³ H01M 2/10
U.S. Cl. 429—98 10 Claims



1. A battery containing mechanism of a compact electronic instrument comprising:

a battery containing chamber provided with an opening for inserting a battery therethrough and provided with a contact for connection with an electrode of the battery;

a pivotable member pivotably held on a side of the opening of said battery containing chamber and biased in a predetermined direction by a spring member; and

a battery lid restrained by said pivotable member to close the opening of said battery containing chamber and to fix the battery in said battery containing chamber.

4,371,596

ADVANCED INORGANIC SEPARATORS FOR ALKALINE BATTERIES AND METHOD OF MAKING THE SAME

Dean W. Sheibley, Sandusky, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 238,790, Feb. 27, 1981, Pat. No. 4,331,746.
This application Dec. 22, 1981, Ser. No. 333,537
Int. Cl.³ H01M 2/16
U.S. Cl. 429—144 8 Claims

1. A method of making a flexible, porous separator for an alkaline EMF cell comprising mixing a binder, a polar organic plasticizer, polar filler particles, and an organic solvent to coat the filler particles with said plasticizer so that there is substantially no particle-to-particle contact, wherein said binder is a non-polar thermoplastic rubber-based resin which is soluble in said organic solvent but which is insoluble and unreactive in the alkaline electrolyte, said plasticizer is reactive with the alkaline electrolyte to produce a reaction product which contains a hydroxyl group and/or a carboxylic group, and said filler particles are unreactive with said electrolyte and consist essentially of between about 5% to 15% by weight of at least one first filler material having a surface area of greater than 25 meters^2/gram, between about 60% to 95% by weight of at least one second filler material having a surface area of 10 to 25 meters^2/gram, and between 0% to 23% by weight of at least one third filler material having a surface area of less than 10 meters^2/gram, said weight percentages being based upon the total weight of the fillers and the weight percentages adding up to 100%, coating said mixture on a porous flexible non-metallic substrate and drying said coating.

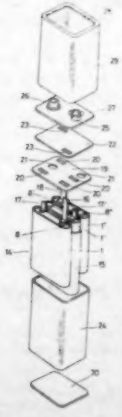
8. The separator formed by the method of claim 1.

4,371,597

LAYER-BUILT CELL

Hironosuke Ikeda, Hirakata; Satoshi Narukawa, and Shigehiro Nakaido, both of Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 26, 1981, Ser. No. 228,685
Claims priority, application Japan, Jan. 31, 1980, 55-11073
Int. Cl.³ H01M 2/24
U.S. Cl. 429—153 4 Claims



1. A layer-built cell comprising:

a cell assembly formed by putting together a plurality of elemental cells each having thereon a positive terminal and a negative terminal such that said terminals of said plurality of elemental cells are located on the same plane;

a first insulating plate disposed on said cell assembly and having therein a plurality of through-bores;

connecting pieces passing through said through-bores of said first insulating plate and over the surface thereof to connect the positive and negative terminals of said plurality of elemental cells electrically in series;

a second insulating plate disposed above said connecting pieces and having two through-bores;

a positive and a negative lead piece each connected to and extending from a respective positive and negative terminal of a cell of the assembly and passing through said through-bores in said first insulating plate and said through-bores in said second insulating plate; and

a terminal plate disposed above said second insulating plate and having thereon a positive external terminal connected to said positive lead piece and a negative external terminal connected to said negative lead piece.

4,371,598

METHOD FOR FABRICATING ALIGNED PATTERNS ON THE OPPOSED SURFACES OF A TRANSPARENT SUBSTRATE

John W. Medernach, Albuquerque, N. Mex.; Ivan A. Novak, Glen Ellyn, and Harry D. Bush, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1981, Ser. No. 280,593

Int. Cl.³ C03C *5/00*

U.S. Cl. 430—22 **4 Claims**

1. A method for fabricating selected aligned metallic electrode patterns on the upper and lower surfaces of a substantially transparent substrate comprising the steps of:

A. Situating an opaque metallic electrode material having a selected pattern on the upper surface of said substrate;

B. Coating the lower surface of said substrate with photoresist;

C. Exposing the upper surface of said substrate to collimated light so as to expose through said substrate the portions of the photoresist on the lower surface which remained unshielded by said opaque metallic electrode material on said upper surface;

D. Removing the portions of the photoresist on said lower surface which was unexposed to light through the substrate;

E. Coating said lower surface with a layer of selected metallic electrode material, and

F. Removing the remaining portions of photoresist on said lower surface to form a selected pattern of selected metallic electrode material on said lower surface substantially vertically aligned with the selected pattern of opaque metallic electrode material on said upper surface.

4,371,599

PROCESS FOR THE PREPARATION OF PRINTING FORMS AND/OR METALLIZED IMAGES

Erwin Lind, Auringen, and Ilse Bader, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1976, Ser. No. 750,434

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1975, 2556386

Int. Cl.³ G03F *7/10*; G03G *13/32*

U.S. Cl. 430—49 **6 Claims**

1. In the process for the preparation of printing forms and/or metalized images by electrostatic charging, exposing, and treating with a toner of a photoconductor layer applied to an electrically conductive support material, and removing the photoconductor layer in the non-image areas, said toner having no adhesive properties or only slight adhesive properties relative to a receiving material, the improvement which comprises effecting removal of the toner-free photoconductor layer only by transferring it, under pressure, in the absence of a solvent and at a temperature in the range of about 50° to 250° C. to a receiving material which has a greater surface adhesion to the photoconductor layer than does the electrically conductive support material.

4,371,600

RELEASE OVERCOAT FOR PHOTORESPONSIVE DEVICE

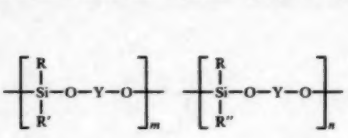
Richard L. Schank, Webster, and Dana G. Marsh, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1981, Ser. No. 278,512

Int. Cl.³ G03G *5/04, 5/07*

U.S. Cl. 430—56 **9 Claims**

1. An overcoated photoresponsive device comprised of a substrate, overcoated with a transport layer, which in turn is overcoated with a photogenerating layer containing therein as a release material a cross-linked silicone polymer of the formula:



wherein R and R′ are independently selected from the group consisting of alkyl, substituted alkyl, aryl, and substituted aryl, R″ is selected from the group consisting of alkenes and substituted alkenes, Y is a dihydroxy radical, and m and n are numbers of sufficient value so as to result in a polymer having a molecular weight of from about 2,000 to about 250,000.

4,371,601

POSITIVELY CHARGED DEVELOPER COMPOSITIONS CONTAINING TELOMERIC AMINES

Roger N. Ciccarelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1981, Ser. No. 259,640

Int. Cl.³ G03G *9/16*

U.S. Cl. 430—110 **16 Claims**

1. A positively charged dry developer composition comprised of resin particles, pigment particles, carrier particles, and a telomeric amine charge enhancing additive of the formula:

$$[A_xB_y]z$$

wherein A is a segment that is soluble/dispersible in the resin particles, B is an amine segment, x and y are numbers representing mole fractions of A and B, the sum of x and y being equal to 1, and Z represents the degree of polymerization, wherein there results a telomeric amine having a number average molecular weight of from about 1,000 to about 10,000.

4,371,602

PHOTOSENSITIVE PRINTING PLATE

Hidenori Iwasaki, 905, Ichinomiya, Samukawa-machi, Kozagun, Kanagawa 253-01; Junichi Igarashi, 11-17, Denenchofu 2 chome, Ohta-ku, Tokyo 145, and Shunichi Kasukawa, 3768, Fujisawa, Fujisawa-shi, Kanagawa 251, all of Japan

PCT No. PCT/JP79/00060, § 371 Date Nov. 13, 1979, § 102(e) Date Nov. 13, 1979, PCT Pub. No. WO79/00748, PCT Pub. Date Oct. 4, 1979

PCT Filed Mar. 9, 1979, Ser. No. 170,670

Claims priority, application Japan, Mar. 13, 1978, 53-27614

Int. Cl.³ G03C *1/60, 1/71*; G03F *7/08*

U.S. Cl. 430—175 **4 Claims**

1. A photosensitive printing plate comprising a support and

a photosensitive layer coated thereon, the photosensitive layer having a roughened surface especially suitable for vacuum contact of a negative thereon, the layer comprising a photosensitive composition containing a photosensitive resin and one or more organic foaming agents in an amount of approximately 3 to 30% by weight based on the photosensitive resin and wherein said organic foaming agent is thermally decomposed prior to exposure to light to produce a gas, thereby roughening the surface of said photosensitive layer;

said resin is selected from the group consisting of polyvinyl cinnamate, derivatives of polyvinyl cinnamate, partially saponified polyvinyl acetate, diazo resin with acrylic copolymer, diazo resin and shellac mixture, condensates of diethyl-p-phenylene diacrylate, condensates of 1,4-di-β-hydroxyethyl-cyclohexane, and o-naphtho-quinonediazide; and

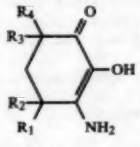
said organic foaming agent is selected from the group consisting of dinitrosopentamethylenetetramine, N,N'-dimethyl-N,N'-dinitrosoterephthalamine, trinitrosotrimethylenetriamine, p-toluenesulfonylhydrazine, benzenesulfonylhydrazine, p,p'-oxybis (benzenesulfonylhydrazine), benzene-1,3-disulfonylhydrazine, 3,3'-disulfonylhydrazinephenylsulfone, toluene-2,4-disulfonylhydrazine, p,p'-thiobis(benzenesulfonylhydrazine), azobisisobutyronitrile, azodicarboneamide(azobisformamide), azoaminobenzene, azocarboxylic acid diethylester (diethylazocarboxylate), hydrazodicarbonamide, N,N'-dibenzoyl-hydrazine, β-acetylphenylhydrazine, biurea, and 1,1-diphenylhydrazine.

4,371,603
AMINO HYDROXY CYCLOHEXENONE DEVELOPING AGENTS

James R. Bartels-Keith, Lexington, and Eva R. Karger, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1980, Ser. No. 221,291
Int. Cl.³ G03C *1/42, 1/48*
U.S. Cl. 430—218 18 Claims

1. A photographic product comprising a support, a silver halide emulsion carried on said support and a developing agent of the formula



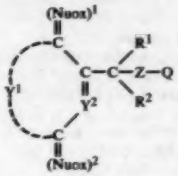
wherein R_1, R_2, R_3 and R_4 each are alkyl, said developing agent being carried in a layer on the same side of the support as said emulsion.

4,371,604
PHOTOGRAPHIC MATERIAL SUITED FOR USE IN DIFFUSION TRANSFER PHOTOGRAPHY

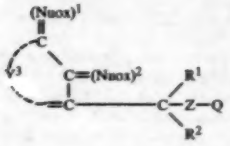
Christian C. Van de Sande, Belsele; Wilhelmus Janssens, Aarschot, both of Belgium; Wolfgang Lässig, and Ernst Meier, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 31, 1981, Ser. No. 249,508
Claims priority, application United Kingdom, Apr. 14, 1980, 8012242
Int. Cl.³ G03C *1/40, 7/00, 1/10*
U.S. Cl. 430—223 12 Claims

1. A photographic silver halide material comprising a support carrying at least one unexposed alkali-permeable silver halide hydrophilic colloid emulsion layer which contains therein a quinonoid compound having a para- or ortho-quinonoid nucleus and which compound is immobile in an alkali-permeable colloid medium when contacted with an alkaline liquid and which contains a photographically useful group and a ballast group, wherein said compound is capable of being reduced by a silver halide developing agent at a rate slower than that of image-wise developable silver halide in the photographic material and in reduced state is capable of releasing said photographically useful group under alkaline conditions, characterized in that said quinonoid compound corresponds to one of the following formulae (A) or (B):



(A)



(B)

wherein:

each of $(Nuox)^1$ and $(Nuox)^2$ (same or different) represents an oxidized nucleophilic group,

Z represents a bivalent atom or a bivalent atomic group, which is electro-negative with respect to the carbon atom carrying R^1 and R^2,

Q together with the group Z represents a releasable photographically useful group,

Y^1 and Y^2 together represent the necessary atoms to close a p-quinonoid ring substituted with (a) directly linked monovalent organic ring or ring system substituent(s) having aromatic character,

Y^3 represents the necessary atoms to close an o-quinonoid ring substituted with (a) directly linked monovalent organic ring or ring system substituent(s) having aromatic character, and

each of R^1 and R^2 (same or different) represents hydrogen or a hydrocarbon group, at least R^1, R^2 or a substituent on the quinonoid ring being or containing a ballasting group X of sufficient size to keep said compound immobile in an alkali-permeable layer of the photographic material when said layer is contacted with an alkaline liquid, the monovalent organic ring or ring system substituent having aromatic character being a monovalent organic substituent derived from an organic substance having only carbon atoms or carbon atoms and (a) heteroatom(s) linked to each other forming a ring or ring system stabilized by resonance due to overlapping π-orbitals of alternating double bonds or of double bonds and (a) lone pair p-orbital(s) of (a) hetero atom(s), whereby the Hückel rule is obeyed, said rule stating that $(4n+2)$ electrons should be present in the overlapping orbitals, n being any positive integer here not including zero.

12. A photographic material according to claim 1, characterized in that the material is a film unit that is adapted to be processed by passing said unit between a pair of juxtaposed pressure-applying members, said unit comprising (1) a photosensitive element, which contains a silver halide emulsion layer having associated therewith said quinonoid compound that is initially immobile in an alkali-permeable colloid medium and wherefrom through the reducing action of a silver halide developing agent and alkalinity a dye is split off in diffusible state, (2) an image dye-receiving layer, (3) means for discharging an alkaline processing composition within the film unit, said means being a rupturable container, which is adapted to be

positioned during processing of the film so that a compressive force applied to the container by the pressure-applying members will effect a discharge of the container's contents within the film, and (4) a silver halide developing agent, which is soluble in an alkaline processing composition locatedwithin said film unit.

4,371,605

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING N-HYDROXYAMIDE AND N-HYDROXYIMIDE SULFONATES

Carl A. Renner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 9, 1980, Ser. No. 214,960

Int. Cl.³ G03C 1/68

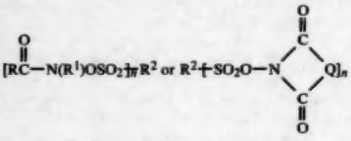
U.S. Cl. 430—280 **26 Claims**

1. The cationically photopolymerizable composition consisting essentially of

(A) a cationically polymerizable organic composition; and

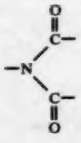
(B) a photoinitiator which is a photosensitive sulfonic acid ester of a N-hydroxyamide or N-hydroxyimide,

wherein the cationically polymerizable organic composition (A) is a monomeric or prepolymeric epoxide; the photoinitiator (B) is of the formula

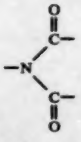


wherein R^2 is a monovalent or divalent organic group selected from aliphatic, cycloaliphatic, and aromatic groups; R is a monovalent organic group selected from aliphatic, cycloaliphatic, and aromatic groups; R^1 is H, a monovalent aliphatic or cycloaliphatic organic group or

Q is the divalent group which when combined with



forms a 5–7 membered ring; and n is 1 or 2; and



which contains, in addition to the essential components, (A) and (B), at least one nonessential additive which is a photosensitizing compound.

4,371,606

2-(HALOGENOMETHYL-PHENYL)-4-HALOGENO-OXAXOLE DERIVATIVES, A PROCESS FOR THE PREPARATION THEREOF, AND RADIATION-SENSITIVE COMPOSITIONS CONTAINING THESE DERIVATIVES

Reinhard Dönges, Bad Soden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

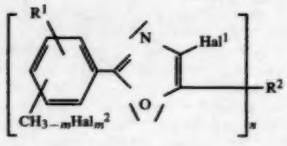
Filed Jun. 9, 1981, Ser. No. 272,049

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1980, 3021599

Int. Cl.³ G03C 1/72

U.S. Cl. 430—281 **11 Claims**

1. 2-(halogenomethyl-phenyl)-4-halogeno-oxazole derivatives of the general formula I



I

wherein

Hal^1 is a halogen atom,

Hal^2 is a chlorine or bromine atom,

m is an integer from 1 to 3,

n is an integer from 1 to 4,

R^1 is a hydrogen atom or a further $CH_{3-m}Hal^2_m$ group, and

R^2 is an n-valent, unsaturated organic radical.

6. A radiation-sensitive composition as claimed in claim 1 which additionally comprises an ethylenically unsaturated compound which is capable of undergoing a polymerization reaction initiated by free radicals.

4,371,607

4-HALOGENO-5-(HALOGENOMETHYL-PHENYL)-OXAZOLE DERIVATIVES, A PROCESS FOR THE PREPARATION THEREOF, AND RADIATION-SENSITIVE COMPOSITIONS CONTAINING THESE DERIVATIVES

Reinhard Dönges, Bad Soden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

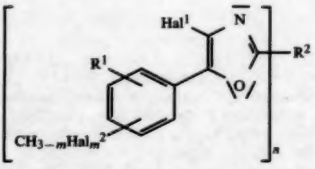
Filed Jun. 9, 1981, Ser. No. 272,050

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1980, 3021590

Int. Cl.³ G03C 1/72

U.S. Cl. 430—281 **10 Claims**

1. 4-halogeno-5-(halogenomethyl-phenyl)-oxazole derivatives of the general formula I



I

wherein

Hal^1 is a halogen atom,

Hal^2 is a chlorine or bromine atom,

m is an integer from 1 to 3,

n is an integer from 1 to 4,

R^1 is a hydrogen atom or a further $CH_{3-m}Hal^2_m$ group, and

R^2 is a n-valent, unsaturated organic radical.

5. A radiation-sensitive composition as claimed in claim 1, which additionally comprises an ethylenically unsaturated

compound which is capable of undergoing a polymerization reaction initiated by free radicals.

4,371,608

RESIST SYSTEM HAVING INCREASED LIGHT RESPONSE

Amitabha Das, Cambridge, Mass., assignor to Ionomet Company, Brighton, Mass.

Filed Jun. 22, 1981, Ser. No. 275,816
Int. Cl.³ G03C *5/00, 1/76*
U.S. Cl. 430—315 **8 Claims**

1. A process of microlithography for preparing an element useful in the production of semiconductor devices comprising

coating a thin layer of silver on a chalcogenide surface on a semiconductor element substrate,

exposing the silver-coated chalcogenide layer to activating radiation in a pattern corresponding to the desired semiconductor device pattern on the substrate in a radiation time and intensity of about 5 milliJoules per square centimeter to form a weak silver image insufficient to form a fully etchable chalcogenide,

removing silver from the background areas of the chalcogenide surface,

treating the chalcogenide surface with a desensitizing agent to neutralize the chalcogenide surface against the subsequent silver deposition thereon from a silver-containing agent,

intensifying the silver image pattern on the chalcogenide with an intensifying agent containing depositable silver to deposit additional silver material on the silver image areas on the chalcogenide, and

driving the silver image into the chalcogenide by suitable radiation to form an etch resistant cap on the chalcogenide in the image areas, whereby there is formed an etchable image on the chalcogenide surface corresponding to a desired semiconductor device pattern.

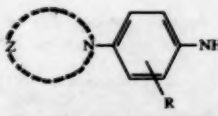
4,371,609

FORMING METHOD OF A DYE IMAGE

Makoto Kajiwara; Akihiko Miyamoto, both of Odawara; Keiji Ohbayashi, Sagamihara, and Masaru Iwagaki, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

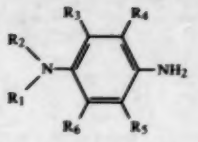
Filed Jul. 16, 1981, Ser. No. 283,911
Claims priority, application Japan, Jul. 19, 1980, 55/98175
Int. Cl.³ G03C *7/00, 5/32*
U.S. Cl. 430—373 **6 Claims**

1. A method for the formation of a dye image which comprises processing a photographic material comprising imagewise distributed catalyzer substance in the presence of hydrogen peroxide, a coupler and an aromatic primary amine compound selected from the compounds represented by the general formulas [I], [II] and [III] below;



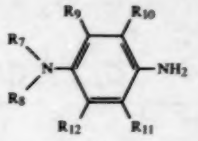
[I]

[wherein, R represents hydrogen atom, an alkyl group, an alkoxy group and a halogen atom and Z represents non-metallic atom group necessary for the formation of a nitrogen containing 5 to 7 membered saturated hetero ring],



[II]

[wherein, R_1 and R_2 independently represent a substituted or unsubstituted alkyl group, R_3, R_4, R_5 and R_6 independently represent hydrogen atom, substituted or unsubstituted alkyl group, alkoxy group or halogen atom provided that at least one of R_3, R_4, R_5 and R_6 is a halogen atom],



[III]

[wherein, R_7 and R_8 independently represent a substituted or unsubstituted alkyl group, R_9, R_{10}, R_{11} and R_{12} independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, alkoxy group or amino group provided that at least one of R_9 and R_{12} is a substituted or unsubstituted alkyl group, alkoxy group or amino group].

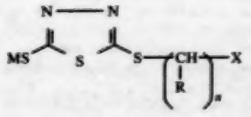
4,371,610

PROCESS FOR DEVELOPMENT-PROCESSING SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Takashi Toyoda; Isamu Itoh, and Minoru Yamada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 24, 1981, Ser. No. 286,482
Claims priority, application Japan, Jul. 24, 1980, 55-101739
Int. Cl.³ G03C *5/30*
U.S. Cl. 430—445 **8 Claims**

1. A method for processing a silver halide black and white light-sensitive material comprising treating said material imagewise exposed with a developing solution which contains 0.1 mole/l or more of sulfite and at least one compound represented by the following general formula (I)



(I)

wherein M represents a hydrogen atom, an alkali metal atom or an ammonium group; R represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; n represents an integer of 1 to 8; and X represents a sulfonic acid group, a sulfonate group, a carboxylic acid group or a carboxylate group.

4,371,611

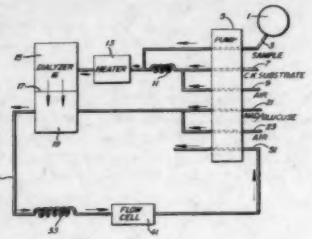
ENZYMATIC DIAGNOSTIC COMPOSITION

Murray C. Fusee, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 931,334, Aug. 7, 1978, Pat. No. 4,226,935. This application Sep. 23, 1980, Ser. No. 189,994
The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.
Int. Cl.³ C12Q *1/00, 1/50*; C12N *11/06*
U.S. Cl. 435—14 **34 Claims**

1. A diagnostic composition comprising a mixture of hexoki-

nase and glucose-6-phosphate dehydrogenase bound in biologically-active form to a carboxylated poly(urea-urethane) polymer matrix having oxyalkylene backbone segments wherein at least 60 mole percent of the oxyalkylene units are oxyethylene,



said carboxylated polymer prepared by reacting an excess of a polyoxyalkylene urethane prepolymer with a polymeric amino acid and wherein said enzymes are bonded to at least one exterior surface of said polymer matrix.

4,371,612

IMMOBILIZATION OF BIOLOGICAL MATERIAL WITH AN ACRYLONITRILE POLYMER

Kunio Matsumoto, Mishima; Rokuro Izumi, Shizuoka; Hideji Seijo, Shizuoka, and Hiroyuki Mizuguchi, Shizuoka, all of Japan, assignors to Toyo Jozo Company, Ltd., Japan

Continuation of Ser. No. 10,997, Feb. 9, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,807

Claims priority, application Japan, Feb. 17, 1978, 53-18001

Int. Cl.³ C12P *37/06;* **C12N** *11/08, 11/06;* **C12P** *35/00*

U.S. Cl. 435—44 **71 Claims**

1. An immobilized material comprising a biologically active enzyme bound by covalent bonding with a crosslinking agent or condensing agent onto a carrier which is a water-insoluble acrylonitrile polymer containing from 20 μM to 1000 μM of amino groups per gram of the polymer and having a porous structure containing a number of micro-pores with an average size of from 40 to 9000 A, said acrylonitrile polymer being produced by effecting reduction of an acrylonitrile polymer having said porous structure in an inert non-solvent with lithium aluminum hydride.

4,371,613

METHOD FOR PRODUCING PURINE ARABINOSIDES

Takashi Utagawa, Kawasaki; Takeshi Miyoshi, Fijisawa; Hirokazu Morisawa, Kawasaki; Akihiro Yamazaki, Yokosuka; Fumihiro Yoshinaga, Fujisawa, and Koji Mitsugi, Yokohama, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Aug. 1, 1978, Ser. No. 930,046

Claims priority, application Japan, Aug. 10, 1977, 52/95766; Dec. 28, 1977, 52/158738; Jan. 11, 1978, 53/1802; Jul. 11, 1978, 53/84196; Jul. 18, 1978, 53/87288

Int. Cl.³ C12P *19/40, 19/32*

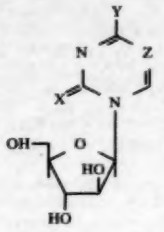
U.S. Cl. 435—88 **12 Claims**

1. A method for producing purine arabinoside, which comprises:

(a) holding at a temperature in the range from 40° C. to 70° C. in an aqueous medium in arabinose donor selected from the group consisting of D-arabinofuranose-1-phosphate, the compound of formula I and the phosphate of said compound, and a purine source selected from the group consisting of unsubstituted or 2,6 and/or 8-substituted purine and its ribofuranoside, ribofuranotide, deoxyribofuranoside or deoxyribofuranotide in the presence of an effective amount of enzyme produced by a bacterium and capable of transarabinosylation from the arabinose donor to the unsubstituted or 2,6 and/or 8-substituted purine of the purine source, whereby β-D-arabinofuranosyl radical is attached to the 9-position of the unsubstituted or 2,6 and/or 8-substituted purine; and

(b) recovering the produced 9-(β-D-arabinofuranosyl)-unsubstituted or 2,6 and/or 8-substituted purine

Formula I:



X represents O, S or NH;

Y represents OH, NH_2, SH or SR (R is a lower alkyl group); and

Z represents H, halogen, NO_2, CH_3 or CH_2OH.

4,371,614

E.COLI BACTERIA CARRYING RECOMBINANT PLASMIDS AND THEIR USE IN THE FERMENTATIVE PRODUCTION OF L-TRYPTOPHAN

David M. Anderson, Rockville, Md.; Klaus M. Herrmann, and Ronald L. Somerville, both of West Lafayette, Ind., assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 180,296

Int. Cl.³ C12N *1/00;* **C12R** *1/19;* **C12N** *9/00;* **C12P** *13/22, 21/00;* **C12N** *15/00, 1/20*

U.S. Cl. 435—108 **34 Claims**

18. A method of producing L-tryptophan by fermentation which comprises:

growing a bacterium which comprises a host of the genus Escherichia deficient in the enzyme tryptophanase, carrying a plasmid with genetic information to control tryptophan production in an appropriate growth medium, and collecting tryptophan from said medium;

wherein said host is resistant to a tryptophan analog.

4,371,615

METHOD FOR STABILIZING THE CHARACTERISTICS OF MICROORGANISM CONTAINING A PLASMID

Kiyoshi Miwa, Matsudo, and Haruo Momose, Kamakura, both of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,633

Claims priority, application Japan, May 23, 1979, 54-63467

Int. Cl.³ C12P *13/08;* **C12N** *15/00;* **C12R** *1/85, 1/19*

U.S. Cl. 435—115 **8 Claims**

1. A method for stabilizing the characteristics of a microorganism containing a plasmid, which comprises:

introducing a plasmid obtained from a microorganism of the genus Escherichia into a mutant of the genus Escherichia, said plasmid having incorporated therein a chromosomal DNA fragment expressing independence of streptomycin, and the growth of said mutant being dependent on streptomycin; and

cultivating and maintaining the stability of said plasmid containing microorganism in a growth medium free of streptomycin.

8. A method for stabilizing the characteristics of a microorganism containing a plasmid, which comprises:

introducing a plasmid obtained from a microorganism of the genus Escherichia into a mutant of the genus Escherichia, said plasmid having incorporated therein a chromosomal DNA fragment expressing independence of streptomycin and a chromosomal DNA fragment expressing threonine

production, and the growth of said mutant being dependent on streptomycin; and

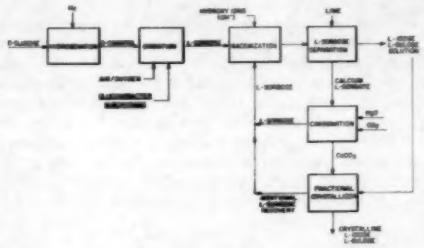
cultivating and maintaining the stability of said plasmid containing microorganism in a growth medium free of streptomycin.

4,371,616

PROCESS FOR PRODUCING L-SUGARS

Derk T. A. Huibers, Pennington, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 26, 1981, Ser. No. 296,094
Int. Cl.³ C12P 19/02; C07H 1/00, 1/06
U.S. Cl. 435—105 23 Claims



1. A method of producing L-sugars including L-idose and L-gulose from D-glucose, which comprises the steps of:

(a) hydrogenating D-glucose to provide D-sorbitol;

(b) oxidizing said D-sorbitol to provide L-sorbose;

(c) racemizing said L-sorbose to provide a mixture of L-sorbose, L-idose and L-gulose; and

(d) precipitating the unracemized L-sorbose under cooling with lime from a dilute solution.

4,371,617

PROCESS FOR PREPARING THIENAMYCIN

Kentaro Tanaka, Suita; Naoki Tsuji, Ashiya; Eiji Kondo, Ikeda, and Yoshimi Kawamura, Mino, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 18, 1981, Ser. No. 244,857
Claims priority, application Japan, Apr. 17, 1980, 55/51007
Int. Cl.³ C12P 17/18; C12R 1/465
U.S. Cl. 435—119 4 Claims

1. A process for preparing thienamycin which comprises cultivating a thienamycin-producing strain of *Streptomyces penemifaciens* sp. nov. or a mutant thereof in a medium under aerobic conditions, and isolating the accumulated thienamycin from the cultured broth.

4,371,618

PROCESS FOR ENZYMATICALLY PRODUCING L-CARNITINE

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jun. 24, 1981, Ser. No. 277,008
Claims priority, application Italy, Jun. 24, 1980, 86253 A/80
Int. Cl.³ C12P 13/00; C12R 1/645
U.S. Cl. 435—128 9 Claims

1. A process for the preparation of L-carnitine which comprises contacting γ-butyrobetaine in the presence of sodium 2-oxoglutarate, a reducing agent, a source of ferrous ions and a hydroxyl group donor solvent, with a source of the hydroxylase enzyme released from the spores of *Neurospora crassa*.

4,371,619

ACETIC ACID BY FERMENTATION

Robert D. Schwartz, Concord, Calif., and Frederick A. Keller, Jr., Naperville, Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 23, 1980, Ser. No. 162,254
Int. Cl.³ C12P 7/54
U.S. Cl. 435—140 10 Claims

1. The method of preparing biologically pure culture of a variant strain of the microorganism *Clostridium thermoaceticum* 99-78-22, accession number ATC 31490, which comprises the steps of:

(1) carrying out a series of fermentations at about 58° C. starting with an acetate tolerant strain of *Clostridium thermoaceticum* which grows in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances, at a pH of 6 and allowing batch growth to proceed under anaerobic conditions until about 15.0 grams of acetic acid per liter of nutrient medium is produced;

(2) transferring an aliquot of the growing culture to a second batch of the same nutrient as in step (1) but with a pH of 5.5 and allowing growth to continue until 16.0 grams of acetic acid per liter of nutrient is produced; and

(3) continuing successive transfers of aliquots of the growing culture medium until about 4.5 grams of acetic acid per liter of nutrient are produced having a pH of 4.5 and a redox potential E, measured with an Ingold Argenthal/Pt electrode of about −220 millivolts.

4,371,620

PROCESS FOR PRODUCING ACYL-COENZYME A OXIDASE

Toshiro Kikuchi; Masaru Ogawa, and Makoto Ando, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 127,536, Mar. 3, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,133
Claims priority, application Japan, Mar. 1, 1979, 54-24232
Int. Cl.³ C12N 9/02; C12Q 1/26; C12R 1/745
U.S. Cl. 435—189 2 Claims

1. A method for the preparation of acyl-coenzyme A oxidase which comprises cultivating an acyl-coenzyme A oxidase-producing microorganism belonging to the genus Candida in a nutrient medium containing a long-chain fatty acid having 10 to 18 carbon atoms, thereby accumulating an amount of acyl-coenzyme A oxidase in yeast cells and recovering the acyl-coenzyme A oxidase from said cells.

4,371,621

MICROBIAL POLYAMINE OXIDASE AT-1

Hideaki Yamada; Yoshiki Tani, and Kimiyasu Isobe, all of Kyoto, Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Filed Dec. 12, 1980, Ser. No. 216,301
Claims priority, application Japan, Dec. 24, 1979, 54-166952
Int. Cl.³ C12R 1/82, 1/66, 21/00
U.S. Cl. 435—191 1 Claim

1. Microbial polyamine oxidase AT-1 having the following physicochemical properties:

(1) Reactivity:
it reacts with spermidine to form 1 mol of putrescine, 1 mol of 3-aminopropionaldehyde and 1 mol of hydrogen peroxide from 1 mol of spermidine and it reacts with spermine to form 1 mol of putrescine, 2 mol of 3-aminopropionaldehyde and 2 mol of hydrogen peroxide from 1 mol of spermine;

(2) Substrate specificity:
it oxidizes spermidine and spermine at a rate of 2:1, but it does not substantially react with other amines;

(3) Optimum pH value:
the optimum pH value is about 6.5;

(4) pH Stability:
when it is treated at 30° C. for 30 minutes, the residual ratio of the activity at a pH value from 5.2 to 6.5 is higher than 90%;
(5) Optimum temperature:
the optimum temperature is about 50° C. at a pH value of 6.5 and the optimum temperature is about 45° C. at a pH value of 7.0;
(6) Temperature stability:
when it is treated at 30° C. for 10 minutes at a pH value of 6.5, the residual ratio of the activity is higher than 90%;
(7) Absorption spectrum:
from the fact that maximum absorptions are observed at 375 nm and 460 nm in the absorption spectrum, it is confirmed that the oxidase is a flavin protein;
(8) Influences of inhibitors and metal ions:
the activity is strongly inhibited by metal ions such as a silver ion and a mercury ion;
(9) Isoelectric point:
the isoelectric point is 5.0 to 5.25;
(10) Molecular weight:
the molecular weight is 130,000 as determined according to the gel filtration method using Sephadex G-200;
(11) Molecular weight of subunit:
the molecular weight of the subunit is 65,000 as determined according to the SDS disc electrophoresis method;
(12) Crystal form:
it takes the form of a needle crystal.

4,371,622

MICROMONOSPORA CULTURE

Miklos Jarai; Sandor Piukovich, both of Budapest; Sandor Istvan, Szentendre; Istvan Gado, Budapest; Valeria Szell, Budapest, and Istvan Barta, Budapest, all of Hungary, assignors to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Jan. 30, 1980, Ser. No. 116,916
Claims priority, application Hungary, Jan. 2, 1979, CI 1906
Int. Cl.³ C12N *1/20;* C12R *1/29*
U.S. Cl. 435—253 **2 Claims**

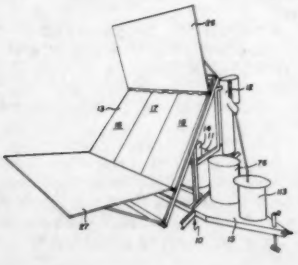
1. A substantially biologically pure culture of the actinomyces species *Micromonospora danubiensis* having the capability of producing sisomicin upon cultivation in an aqueous nutrient medium.

4,371,623

SOLAR STILL

G. Brandt Taylor, Berlin, Mass., assignor to William N. Durkin, Boston, Mass., a part interest

Filed Feb. 9, 1981, Ser. No. 233,031
Int. Cl.³ C07C *29/80;* C12M *1/38;* C12P *7/14*
U.S. Cl. 435—290 **11 Claims**



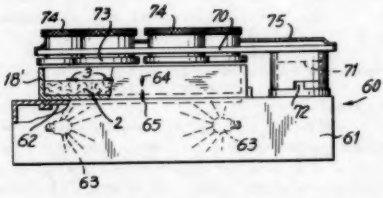
1. A solar still for producing alcohol, comprised of:
(a) at least one fermenting tank adapted to produce a beer by fermentation,
(b) a heat exchanger,
(c) a solar collector adapted to absorb energy from the sun and use that energy to heat a working fluid,
(d) a working fluid conveying system adapted to circulate the working fluid through the solar collector and through the heat exchanger,
(e) a distillation unit comprising:
(1) a stripping fractioning column,
(2) a rectification fractioning column, and
(3) a transfer conduit operatively connecting the top of the stripping column to the bottom of the rectification column,
(f) transferring means adapted to convey the beer from the fermenting tank to the heat exchanger, wherein energy from the working fluid is transferred to the beer, the beer and the working fluid flowing in separate conduits so that the beer and working fluid never mix, and
(g) means for conveying the beer from the heat exchanger to the top of the stripping column where the beer is divided into an alcohol rich vapor phase stream which passes through the transfer conduit to the rectification column where it moves up the rectification column and an alcohol weak stream which flows downwardly through the stripping column, whereby beer in the vapor phase from the alcohol weak stream moves up the stripping column, through the transfer conduit to the bottom of the rectification column and up the rectification column.

4,371,624

APPARATUS AND TESTING REACTIONS

Rolf Saxholm, Box 3, 1362 Billingstad, Norway

Division of Ser. No. 716,684, Aug. 23, 1976, Pat. No. 4,213,825, which is a continuation-in-part of Ser. No. 502,107, Aug. 30, 1974, Pat. No. 3,981,776, which is a continuation-in-part of Ser. No. 156,738, Jun. 25, 1971, Pat. No. 3,843,450, which is a continuation-in-part of Ser. No. 705,539, Feb. 14, 1968, abandoned. This application Jan. 15, 1980, Ser. No. 112,407
Int. Cl.³ C12M *1/34, 1/16;* C12Q *1/18, 1/00*
U.S. Cl. 435—291 **8 Claims**

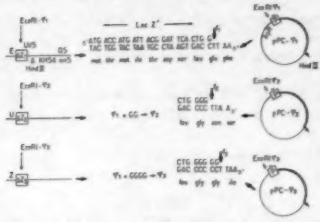


1. A reader device adapted for the detection of results of a reaction on a substrate due to application thereon of an article operatively combined with magnetically responsive means and adapted for containing an active constituent, said reader device comprising means for producing a magnetic field for acting on the magnetically responsive means combined with said article to hold the article in operative position with the substrate, viewer means for viewing the substrate and the article applied thereto, measuring means operatively associated with said viewer means for determining the magnitude of any result due to reaction, first electrical means coupled to the measuring means for producing in response thereto, a first electrical signal for each article indicative of the magnitude of the result thereof, second electrical means for producing a second electrical signal for identifying said article, and third electrical means for correlating the first and second electrical signals for said article.

4,371,625
VECTORS FOR THE INSERTION THEREIN OF FOREIGN DNA FRAGMENTS, ACCORDING TO ANY TRANSLATION PHASE

Pierre Tiollais, Paris, France, assignor to Institut Pasteur and Inst. Nat'l de la Sante et Recherche, both of Paris, France

Filed Nov. 13, 1979, Ser. No. 93,270
Claims priority, application France, Nov. 13, 1978, 78 32041
Int. Cl.³ C12N 1/00, 15/00
U.S. Cl. 435—317 24 Claims



1. A composition of matter for the introduction of foreign DNA into a host whereby the expression of a protein having a desired amino acid sequence is provided, said composition of matter comprising the following three structurally interrelated vectors:

(A) a first vector which comprises:
- (i) a preselected bacterial promoter in association with a preselected bacterial gene or part thereof, said preselected bacterial gene or part thereof comprising a translation initiation point,
- (ii) a single recognition site for a preselected restriction endonuclease, said site being in association with the preselected bacterial gene or part thereof, and
- (iii) a plurality of nucleotide base pair triplets between the translation initiation point of the gene or part thereof and the single restriction endonuclease recognition site associated with the gene or part thereof, wherein the plurality of nucleotide base pair triplets does not contain a nonsense codon, and

(B) a second vector which comprises
- (i) (A) (i),
- (ii) (A) (ii) and
- (iii) the plurality of nucleotide base pair triplets plus two additional nucleotide base pairs between the translation initiation point of the gene or part thereof and the single restriction endonuclease recognition site associated with the gene or part thereof, wherein the plurality of nucleotide base pair triplets does not contain a nonsense codon, and

(C) a third vector which comprises:
- (i) (A) (i),
- (ii) (A) (ii) and
- (iii) the plurality of nucleotide base pair triplets plus 1 or 4 additional nucleotide base pairs between the translation initiation point of the gene or part thereof and the single restriction endonuclease recognition site associated with the gene or part thereof, wherein the plurality of nucleotide base pair triplets does not contain a nonsense codon.

4,371,626
METHOD OF UPGRADING CRUDE SODIUM BENTONITE

Donald A. Hentz, Spearfish, S. Dak., assignor to Aurora Industries, Inc., Montgomery, Ill.

Filed Apr. 13, 1981, Ser. No. 253,787
Int. Cl.³ C09C 1/28, 1/42
U.S. Cl. 501—145 6 Claims

1. A method of upgrading crude sodium bentonite to improve its fluid loss properties, said method comprising subjecting the crude bentonite to shearing forces that are sufficient to increase the methylene blue uptake by the bentonite, and then drying and pulverizing the bentonite.

4,371,627
PROCESS FOR THE CATALYTIC SYNTHESIS OF METHANE BY REACTING HYDROGEN WITH CARBON MONOXIDE

Yves Chauvin, Le Pecq; Dominique Commereuc, Meudon, and Andre Sugier, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 30, 1981, Ser. No. 307,150
Claims priority, application France, Sep. 30, 1980, 80 21000
Int. Cl.³ C07C 1/04
U.S. Cl. 518—700 14 Claims

1. In a process for manufacturing methane by reacting hydrogen with carbon monoxide in an inert liquid hydrocarbon medium, in the presence of a catalyst manufactured by reacting at least one nickel compound with at least one reducing aluminum compound in an inert liquid hydrocarbon medium,

the improvement wherein said catalyst is the product obtained by reacting said nickel compound with said reducing aluminum compound in the presence of at least one hydrocarbon-soluble titanium compound in a non-oxidizing atmosphere; wherein the amount by weight of titanium relative to the aggregate (nickel+titanium), expressed as the metals, is from 1 to 50%; and wherein the atomic ratio of aluminum/(nickel+titanium) is from 1/1 to 20/1.

4,371,628
PROCESS FOR THE PREPARATION OF AROMATIC HYDROCARBONS USING CRYSTALLINE SILICATES AS CATALYST

Johannes M. Nanne, and Martin F. M. Post, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 28, 1980, Ser. No. 172,734
Claims priority, application Netherlands, Aug. 2, 1979, 7905941
Int. Cl.³ C07C 1/04
U.S. Cl. 518—713 11 Claims

1. A process for the preparation of an aromatic hydrocarbon mixture which comprises contacting at an elevated temperature and reaction conditions an H_2/CO mixture having an H_2/CO molar ratio below 1.0, with a mixture of two catalysts of which one has the capability of catalyzing the conversion of an H_2/CO mixture into acyclic oxygen-containing hydrocarbons and the other is a crystalline iron silicate having the following properties:
- (a) thermally stable up to a temperature above 600° C.,
- (b) an X-ray powder diffraction pattern having, inter alia, the reflections given in Table A of the specification,
- (c) the composition of the silicate, expressed in moles of the oxides, includes oxides of hydrogen, alkali metal and silicon, and iron and has an Fe_2O_3/SiO_2 molar ratio (m) less than 0.1, said crystalline iron silicate having been prepared by a process comprising maintaining at an elevated temperature an aqueous mixture containing: at least one compound of an alkali metal (M), at least one quaternary alkylammonium compound (R_4NX), at least one silicon compound and at least one iron compound, in which mixture the compounds are present in the following ratios, expressed in moles of the oxides:

M_2O: $(R_4N)_2O$=0.4–1.0,
$[M_2O+(R_4N)_2O]:SiO_2$=0.24–0.40,
$SiO_2:Fe_2O_3$>10, and
$H_2O:SiO_2$=5–50,

until the crystalline silicate has formed, and separating the silicate from the mother liquor; and separating an aromatic hydrocarbon mixture from the reaction product.

4,371,629

PREPARATION OF A SEMIFLEXIBLE ENERGY MANAGEMENT POLYETHER POLYURETHANE FOAM USING AS A CROSSLINKER-SURFACTANT AN ETHYLENE OXIDE ADDUCT OF A MANNICH CONDENSATE PREPARED FROM THE REACTION OF NONYL PHENOL, DIETHANOLAMINE AND FORMALDEHYDE

Thomas H. Austin, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 191,976, Sep. 29, 1980, abandoned. This application Sep. 17, 1981, Ser. No. 303,259

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—115 **15 Claims**

1. In a method for preparing a molded flexible polyurethane product wherein a polyol, a polyisocyanate, water and a crosslinker are reacted in a closable mold to form the polyurethane product the improvement which comprises

using a crosslinker comprising an ethylene oxide adduct of a Mannich condensate prepared from the reaction of nonyl phenol, diethanolamine and formaldehyde.

4,371,630

SOLUTION OF A POLYURETHANE IN A POLYOL AND A PROCESS FOR USING SUCH A SOLUTION IN THE PRODUCTION OF POLYURETHANE PLASTICS

Klaus König, Leverkusen; Hans-Walter Illger, Rösrath; Peter Seifert, Bergisch-Gladbach, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 236,949

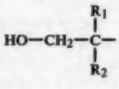
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008590

Int. Cl.³ C08G *18/14, 18/32, 18/42*

U.S. Cl. 521—173 **20 Claims**

1. A solution of a polyurethane in a polyol comprising:

(a) the reaction product of a polyisocyanate with a diprimary diol, said diprimary diol having a molecular weight of from 90 to 800 and a structure at both hydroxyl groups corresponding to the general formula:



in which

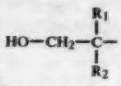
R_1 represents chlorine or an alkyl, cycloalkyl, aralkyl or aryl radical having from 1 to 10 carbon atoms, which radical may be substituted or interrupted by chlorine, ester groups, ether groups, amide groups, urethane groups or nitrile groups, and

R_2 represents hydrogen or a radical within the definition of R_1; and

(b) a polyether with an average molecular weight of from 500 to 12,000 having at least two hydroxyl groups, in which at least 80% of the hydroxyl groups are secondary; with the reaction product (a) comprising from 3 to 60 wt. % of the solution.

15. A process for the production of polyurethane flexible foamed plastics comprising reacting polyisocyanates with high molecular weight compounds having at least two hydroxyl groups and water, characterized in that the higher molecular weight compound having at least two hydroxyl groups is a solution comprising:

(a) the reaction product of a polyisocyanate and a diprimary diol, said diol having a molecular weight of from 90 to 800 and a structure at both hydroxyl groups corresponding to the formula:



wherein

R_1 represents chlorine, an alkyl, cycloalkyl, aralkyl or aryl radical having from 1 to 10 carbon atoms, which carbon atoms may be substituted or interrupted by chlorine, ester groups, ether groups, amide groups, urethane groups, nitrile groups or a combination of such groups, and

R_2 represents hydrogen or a radical within the definition of R_1; and

(b) a polyether with an average molecular weight of from 500 to 12,000, said polyether having at least two hydroxyl groups with at least 80% of said hydroxyl groups being secondary hydroxyl groups.

4,371,631

BACKING PLATE COMPOSITION FOR BRAKE SHOES

Walter B. Peters, Englewood, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Aug. 3, 1981, Ser. No. 289,142

Int. Cl.³ C08J *5/14*; C08L *7/00, 9/00, 61/10*

U.S. Cl. 523—153 **6 Claims**

1. An asbestos-free sound attenuating backer plate composition capable of being directly molded between the metal backer plate and the friction material of tread-type railroad brake shoe and providing adhesion therebetween comprising by volume;

between 35–45% of organic fiber reinforced rubber tire friction stock, wherein said tire friction stock contains about 40% by weight of rayon, nylon or polyester fibers, and said tire friction stock is present in a size which facilitates blending with the other components of said backer plate composition;

between 5–25% additional chopped or shredded reinforcing fiber comprising fiber glass or mineral wool or cotton linters;

between 15–25% rubber makers hard clay;

between 15–25% anhydrous alumino silicate;

between 5–10% phenolic resin with the balance comprising rubber curing accelerators; zinc oxide and carbon black and wherein the rubber curing component and the additional reinforcing fiber are present in sufficient amounts to provide adequate shear strength for use as backer plate having a density in the finished product of from between 1.6 to 1.9 gm/cc at 25 degree C.

4,371,632

COMPOSITIONS, PROCESSES, AND WRITING ELEMENTS EMPLOYING RESINS OF THE THERMOSETTING TYPE

Harold Grossman, Silver Spring, Md.; Richard E. Merrill, Wakefield, and Paul B. Monaghan, Lexington, both of Mass., assignors to Empire Enterprises, Inc., Shelbyville, Tenn.

Filed Apr. 24, 1981, Ser. No. 257,246

Int. Cl.³ C08K *3/04*; C09D *13/00*

U.S. Cl. 523—164 **31 Claims**

1. A composition for the manufacture of a cured extruded pencil core, comprising a blended extrudable mixture of a marking material, a phenolic novolac resin, a resin hardener, a plasticizer, and a lubricant, and wherein the ingredients of the composition have the following approximate proportions, by weight:

Ingredient	Percentage
Marking Material	55–75%

-continued

Ingredient	Percentage
Resin (including hardener)	10-28%
Plasticizer	2-12%
Lubricant	4-22%

4,371,633

COATING COMPOSITION FOR ROADS AND OTHER SURFACES COMPRISING CHLORINATED RUBBER, CHLORINATED PARAFFIN AND AMORPHOUS SILICA

Alex N. Soltysyk, 1111 Woodlawn Dr., Newcastle, Ind. 47362

Filed Apr. 30, 1981, Ser. No. 258,903

Int. Cl.³ C08K 5/01; H02G 15/00; C08K 3/36

U.S. Cl. 523—172 2 Claims

1. A coating composition adapted for application to the surface of a road or driveway comprising about 10 to 25 weight percent chlorinated rubber, 8 to 20 weight percent solid chlorinated paraffin, 2 to 5 weight percent liquid chlorinated paraffin, 2 to 15 weight percent powdered amorphous silica, 20 to 50 weight percent chlorinated hydrocarbon solvent and 20 to 50 weight percent non-chlorinated solvent.

4,371,634

MICROCAPSULE-CONTAINING WAX COMPOSITION

Dietrich Hoffman, Roedersheim-Gronau, and Wolfgang Sliwka, Weinheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,709

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044113

Int. Cl.³ C08L 61/28

U.S. Cl. 523—208 9 Claims

1. A microcapsule-containing wax composition which contains—based on (a+b+c):

(a) from 20 to 55% by weight of microcapsules,

(b) from 79 to 30% by weight of wax or of a mixture of different waxes, of melting point from about 50° to 140° C.,

(c) from 1 to 10% by weight of at least one non-ionic emulsifier, at least one alkali metal salt of a montan wax acid or a mixture of (α) at least one non-ionic emulsifier and (β) at least one alkali metal salt of a montan wax acid or alkali metal C_{10}–C_{20}-fatty alcohol-sulfate and/or alkali metal C_{10}–C_{20}-alkanesulfonate, or a mixture of these,

(d) from 0 to 20% by weight of one or more pigments, one or more fillers or a mixture of these and

(e) from 0 to 60% by weight of volatile constituents, the wall material of the microcapsules (a) being a polymeric melamine-formaldehyde condensate which is obtained by condensing melamine with formaldehyde or condensing methylolmelamines and/or their methyl ethers, using a ratio of melamine to formaldehyde of from 1:2 to 1:6, at a pH of from 3.5 to 5.5 and at from 60° to 100° C., and then hardening for from 2 to 10 hours at from 60° to 100° C., the ratio of core material to wall material in the capsules being from 1:15 to 1:2 and the microcapsules having a diameter of from 2 to 10 μm.

4,371,635

FILLED HIGH VINYL POLYBUTADIENE THERMOSETTING COMPOSITIONS CONTAINING A MALEIC ANHYDRIDE-POLYBUTADIENE ADDUCT

Guy Senatore, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1982, Ser. No. 357,119

Int. Cl.³ C08K 3/40, 3/22, 5/14

U.S. Cl. 523—219 23 Claims

1. A composition comprising an admixture of:

(a) a high vinyl alkadiene polymer, having at least 50 percent of the alkadiene units bonded together in the 1, 2 mode of addition;

(b) organic peroxide;

(c) an adduct of an alkadiene polymer with an anhydride of a mono- or dicarboxylic acid, and

(d) an inorganic filler.

4,371,636

PREPARATION OF COPOLYMER DISPERSIONS HAVING A NARROW PARTICLE SIZE DISTRIBUTION, AND EXHIBITING DILATANT FLOW OVER A BROAD RANGE OF CONCENTRATIONS

Dieter Distler, Mutterstadt; Hans Wolf, Ludwigshafen, and Gerhard Welzel, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,548

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025562

Int. Cl.³ C08L 35/06

U.S. Cl. 523—223 6 Claims

1. A process for the preparation of copolymer dispersions having a narrow particle size distribution, and exhibiting dilatant flow over a broad range of concentrations, which comprises emulsion copolymerization of (a) from 2 to 10% by weight, based on total monomers, of a,b-monoolefinically unsaturated monocarboxylic acids or dicarboxcylic acids (b) from 0 to 98% by weight of acrylic acid esters or methacrylic acid esters of alkanols of 1 to 4 carbon atoms, (c) from 0 to 98% by weight of styrene or methyl methacrylate; and (d) from 0 to 3% by weight of polyolefinically unsaturated monomers; the amount of the monomers (b) and (c) together being from 90 to 98% by weight, at 60°–95° C., in the presence of from 0 to 0.5% by weight of an anionic emulsifier and from 0 to 1% by weight of a non-ionic emulsifier, the percentages being based on the weight of monomers, with simultaneous agglomeration but only partial fusion of the initially formed polymer particles, which have a diameter of from 5 to 200 nm, at a temperature of ±10° C. of the glass transition temperature of the copolymer formed, and thereafter adjusting the copolymer content of the aqueous copolymer dispersion formed to 35–55% by weight and the pH to 3.8–5.0, unless these values already obtain.

4,371,637

MIXTURES OF REACTION PRODUCTS BASED ON EPOXIDES, PRIMARY AMINES AND FATTY ACIDS AND OF AMINOPLAST PRECONDENSATES, THEIR PREPARATION AND THEIR USE AS LEATHER DRESSINGS

Rosemarie Topfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 2, 1981, Ser. No. 279,508

Claims priority, application Switzerland, Jul. 11, 1980, 5350/80

Int. Cl.³ C08G 8/32, 59/00; C08L 61/26, 63/02

U.S. Cl. 523—416 27 Claims

1. A mixture of a reaction product (1) and an aminoplast precondensate (2), which mixture contains (1) a reaction product obtained from the following reactants: (a) an epoxide having at least two epoxy groups per molecule, (b) a primary amine having 2 to 8 carbon atoms and (c) a polymerised fatty acid which is derived from monomeric, unsaturated fatty acids having 16 to 22 carbon atoms, and (2) as the second component of the mixture, an aminoplast precondensate etherified by alkyl having 1 to 6 carbon atoms.

4,371,638

BINDER COMPOSITIONS FOR POWDER COATINGS FROM MIXED SATURATED RESINS

Daniel Bernelin, Ris Orangis, and Jacques Meyer, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 12,020, Feb. 14, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,521

Claims priority, application France, Feb. 20, 1978, 78 04685

Int. Cl.³ C08L *67/02, 63/00, 63/02*

U.S. Cl. 523—427 **31 Claims**

1. A binder composition for use in powder coatings comprising

at least two saturated cross-linking resins wherein said at least two saturated cross-linking resins comprise resins selected from the group consisting of saturated polyester and epoxy resins, and

a cross-linking agent,

said resins exhibiting different reactivities with respect to said cross-linking agent such that a system comprising the most highly reactive resin and the cross-linking agent, with said system having a weight ratio of cross-linking agent/resin such that there is stoichiometric equilibrium, exhibits a curve on a mechanical spectrometer in an isothermal enclosure at 200° C. having a slope, in its rectilinear part, that is between 0.5×10^5 and 10^6 dynes/cm^2/minute, and that a system comprising the lesser reactive resin and the cross-linking agent, same having a weight ratio of cross-linking agent/resin such that the ratio of the reactive functions of the cross-linking agent to those of the resin is between about 1.5 and 4 times the stoichiometric ratio, exhibits a curve on a mechanical spectrometer in an isothermal enclosure at 200° C. which has a slope, in its rectilinear part, that is between about 10^3 and 6×10^3 dynes/cm^2/minute.

4,371,639

POLYESTER POLYMER CONCRETE COMPOSITIONS

Larry C. Muszynski, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 3, 1981, Ser. No. 250,990

Int. Cl.³ C08K *3/34;* **C08L** *67/06*

U.S. Cl. 523—512 **13 Claims**

1. A curable polymer concrete composition, suitable for articles of construction, comprising:

(1) from about 3% to about 15% by weight of a polyester composition,

(2) from about 85% to about 97% by weight of an aggregate composition comprising

(a) from about 50% to about 95% by weight of sand, and

(b) from about 5% to about 50% by weight of fly ash, and

(3) a free-radical initiator.

4,371,640

HOT MELT ADHESIVE COMPOSITIONS

Pawan K. Agarwal, Westfield, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 12, 1981, Ser. No. 292,191

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—66 **13 Claims**

1. A hot melt adhesive composition which comprises:

(a) an amine terminated polyalkylene oxide neutralized sulfonated thermoplastic resin, said neutralized sulfonated thermoplastic resin having about 5 to about 250 meq. of neutralized sulfonated groups per 100 grams of said amine terminated polyalkylene oxide neutralized sulfonated thermoplastic resin; and

(b) about 25 to about 200 parts by weight of a hydrocarbon tackifying resin consisting of a petroleum or coal tar distillate per 100 parts by weight of said amine terminated polyalkylene oxide neutralized sulfonated thermoplastic resin.

8. A composition according to claim 1 wherein said composition is extended with a filler or oil or mixture thereof, wherein said filler is selected from the group consisiting of talcs, calcium carbonates, delaminated calcined and hydrated clays, silicas and carbon blacks and mixtures thereof and said oil is selected from the group consisting of naphthenic, aromatic and paraffin petroleum oils.

4,371,641

BITUMEN-CONTAINING EXTENDED COMPOSITIONS

Gerard A. M. Boyer, Notre Dame de Bondeville, France; Ilan Duvdevani, Leonia, N.J., and Jean-Marie A. Muller, Biborel, France, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 21, 1981, Ser. No. 333,127

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—70 **11 Claims**

1. A bitumen-containing composition which comprises:

(a) bitumen;

(b) about 5 to about 25 parts by weight of a neutralized sulfonated polymer per 100 parts by weight of the bitumen; and

(c) about 0 to about 100 parts by weight of a filler per 100 parts by weight of the bitumen.

4,371,642

PROCESS FOR PREPARING POLYOLEFIN RESIN EXTENDED PIGMENTS

Edward E. Jaffe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 7, 1981, Ser. No. 281,195

Int. Cl.³ C08K *5/56;* **C09B** *48/00, 47/04;* **C08K** *5/34*

U.S. Cl. 524—88 **8 Claims**

1. A process comprising dry premilling a crude organic pigment followed by milling the premilled pigment with shot and from 10 to 75 percent by weight, based on the amount of pigment and resin present of a thermoplastic resin in an organic liquid in which said resin is soluble to an extent of less than 5 g per liter at 30° C. and which wets the surface of the pigment particles and can improve their crystallinity while maintaining said pigment and said resin in a finely divided solid state, and recovering a resin extended pigment of pigmentary particle size.

4,371,643

PARTICLE SIZE REDUCTION OF PIGMENTS BY NON-SALT MILLING

Daniel W. Thomas, Bridgewater, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 174,397, Jul. 31, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,584

Int. Cl.³ C08L *39/04*

U.S. Cl. 524—88 **5 Claims**

1. A process for the reduction of the particle size of a quinacridone pigment or a phthalocyanine pigment containing statistically up to about one substituent per molecule which comprises dry milling one hundred parts by weight of a crude dry pigment in an apparatus having attrition and shearing action with (a) from about 1.5 to 10 parts by weight of a hydroxylic solvent and (b) from about 2 to 20 parts by weight of a polar polymer, for a period of time sufficient to reduce the particle size of said crude pigment to one micron or less and recovering from said apparatus a dry, free-flowing pigment composition.

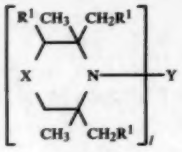
4,371,644

PIPERIDINE DERIVATIVES AND THEIR USE AS POLYMER STABILIZERS

Nobuo Soma; Syoji Moromura; Takao Yoshioka, and Tomoyuki Kurumada, all of Hiromachi, Japan, assignors to Sankyo Company Ltd., Tokyo, Japan

Division of Ser. No. 866,957, Jan. 5, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 168,271
Claims priority, application Japan, Jan. 14, 1977, 52-3285
Int. Cl.³ C08K 5/34
U.S. Cl. 524—102 4 Claims

1. A stabilized polymer composition comprising a polymer which does not react with hydroxy groups having incorporated therein, in an amount to stabilize it against thermal- and/or photo-deterioration, a piperidine derivative of formula (I):

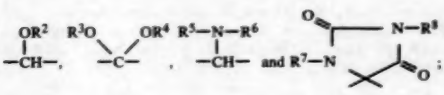


(I)

wherein:

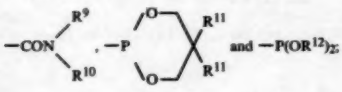
R^1 represents a hydrogen atom or a methyl group;

X represents one of the groups of formula $—CH_2—$,



wherein:

R^2 represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an allyl group, a benzyl group, an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms, wherein the aromatic moiety is unsubstituted or substituted by one or more C_1–C_4 alkyl and/or hydroxy groups, or one of the groups of formula



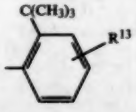
wherein:

R^9 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

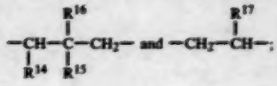
R^{10} represents an alkyl group having from 1 to 18 carbon atoms, a phenyl group which is optionally substituted by one or more methyl and/or chlorine substituents, a naphthyl group or a cyclohexyl group;

R^{11} represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; and

R^{12} represents an alkyl group having from 1 to 4 carbon atoms, a phenyl group or a group of formula



in which R^{13} represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; R^3 and R^4 are the same or different and each represents an alkyl group having from 1 to 4 carbon atoms, or R^3 and R^4 together represent one of the groups of formula

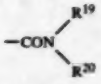


in which:

R^{14} and R^{15} are the same or different and each represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms; and

R^{16} and R^{17} are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms or a group of formula $—CH_2OR^{18}$;

in which R^{18} represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms, wherein the aryl moiety is optionally substituted by one or more C_1–C_4 alkyl and/or hydroxy groups, or a group of formula



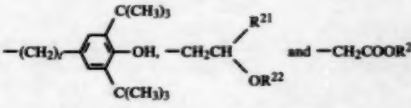
in which R^{19} is any one of the groups hereinbefore defined for R^9 and R^{20} is any one of the groups hereinbefore defined for R^{10};

R^5 represents an alkyl group having from 1 to 18 carbon atoms, a phenyl group which is optionally substituted by one or more C_1–C_4 alkyl and/or alkoxy substituents, a benzyl group or a cyclohexyl group;

R^6 represents an alkyl group having from 1 to 18 carbon atoms, a benzyl group or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms, in which the aryl moiety optionally has one or more C_1–C_4 alkyl and/or hydroxy substituents; or R^5 and R^6 together represent a tetramethylene group, a pentamethylene group or a group of formula $—(CH_2)_2—O—(CH_2)_2—$;

R^7 represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an allyl group, an acetyl group or a benzyl group; and

R^8 represents an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having 3 or 4 carbon atoms, a benzyl group or a group of formula



in which:

t represents 1, 2 or 3;

R^{21} represents a hydrogen atom, a methyl group or a phenyl group;

R^{22} represents a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, an allyl group, a benzyl group or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms, wherein the aryl moiety optionally has one or more C_1–C_4 alkyl and/or hydroxy substituents; and

R^{23} represents an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having 3 or 4 carbon atoms or a phenyl group;

l represents 2 or 3; and

when l=2:

Y represents one of the groups of formula $—CH_2C-$

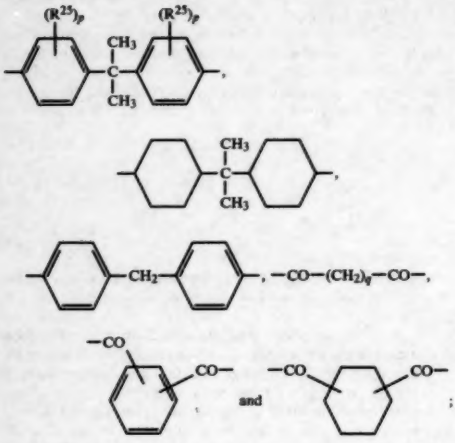
$H(OZ)CH_2-[OCH_2CH(OZ)CH_2]_2-$, $-CH_2C-H(OZ)CH_2-[OCH_2CH(R^{24})]_m-OCH_2CH(OZ)CH_2-$ and $-CH_2CH(OZ)CH_2-[OWO-CH_2CH(OZ)CH_2]_n-$;

wherein:

m and n each represent integers of from 1 to 10;

R^{24} represents a hydrogen atom or a methyl group;

W represents one of the groups of formulae



wherein:

p represents 0, 1 or 2;

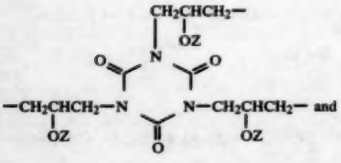
R^{25} represents a halogen atom; and

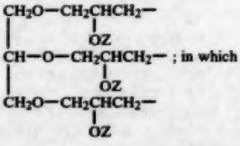
q represents an integer of from 1 to 10; and

Z represents any one of the groups defined for R^2;

when l=3:

Y represents one of the groups of formula





in which

Z is as defined above;

or an acid addition salt thereof.

4,371,645

POLYOLEFIN PLASTIC COMPOSITIONS COMPRISING META- OR PAPA-DERIVATIVES (CHORO- OR BROMO-) OF DI-BENZYUIDENE SORBITOL

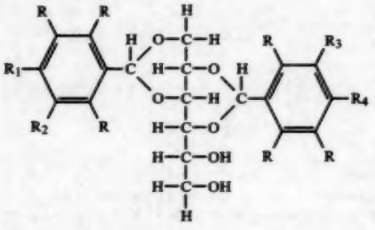
Robert L. Mahaffey, Jr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 143,258, Apr. 24, 1980, abandoned. This application Jul. 29, 1981, Ser. No. 288,082

Int. Cl.³ C08L 23/02, 23/04, 23/18; C08K 5/06

U.S. Cl. 524—108 9 Claims

1. A polyolefin plastic composition having improved transparency, which comprises a polymer selected from aliphatic polyolefins and copolymers containing at least one aliphatic olefin and one or more ethylenically unsaturated aliphatic comonomers and at least one di-acetal of sorbitol; said di-acetal of sorbitol having the structure:



wherein R, R_1, R_2, R_3 and R_4 are selected from hydrogen, lower alkyl, hydroxy, methoxy, mono- and di-alkylamino, amino, nitro and halogen, with the proviso that at least one of R_1, R_2, R_3 and R_4 is chlorine or bromine.

4,371,646

2,6-DI-TERTIARY BUTYL PHENYL PHOSPHITES AND SYNTHETIC RESIN COMPOSITIONS HAVING ENHANCED STABILITY TO HEAT AND LIGHT

Motonobu Minagawa, Kosigaya, and Yutaka Nakahara, Iwatsuki, both of Japan, assignors to Adeka Argus Chemical Co. Ltd., Urawa, Japan

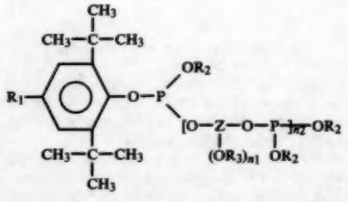
Filed Dec. 29, 1980, Ser. No. 220,405

Claims priority, application Japan, Dec. 26, 1979, 54-170097

Int. Cl.³ C07F 9/145, 9/15; C08K 5/52

U.S. Cl. 524—119 30 Claims

1. 2,6-Di-tertiary butyl phenyl phosphites having the structure:



wherein:

R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and $(CH_2)_mCOOR$, where R is selected from the group consisting of alkyl having from one up to about ten carbon atoms; cycloalkyl having from three up to about twelve carbon atoms; alkaryl and aryl having from six to about twelve carbon atoms; and m is a number within the range from 0 to 5;

R_2 is selected from the group consisting of hydrogen, alkyl having from one to about twenty-two carbon atoms; cycloalkyl having from three up to about twelve carbon atoms; alkaryl and aryl having from six to about eighteen

carbon atoms; the residue of a polyhydric alcohol having from two to about eighteen carbon atoms, and from two to three hydroxyl groups; and the residue of a polyphenol having from six to about eighteen carbon atoms and from two to about ten phenolic hydroxyl groups;

R_3 is selected from the group consisting of hydrogen and $P(OR_2)_2$;

Z is the bivalent to tetravalent residue of a polyhydric alcohol having from two to about eighteen carbon atoms, and from two to five hydroxyl groups; or of a polyphenol having from six to about eighteen carbon atoms and from two to about ten phenolic hydroxyl groups;

n_1 is 0 or 1; and n_2 is a number from 1 to 5.

21. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group:

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a phosphite in accordance with claim **1**.

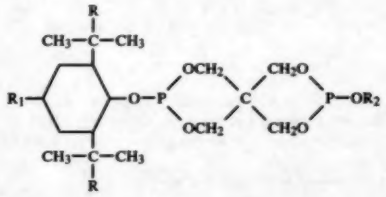
4,371,647

2,6-DI-TERTIARY BUTYL PHENYL PENTAERYTHRITOL SPIRO BIS-PHOSPHITES ENHANCING THE STABILITY TO HEAT AND LIGHT OF SYNTHETIC RESIN

Motonobu Minagawa, Kosigaya; Yutaka Nakahara, Iwatsuki, and Etsuo Tobita, Tokyo, all of Japan, assignors to Adeka Argus Chemical Co. Ltd., Urawa, Japan

Filed Jan. 7, 1981, Ser. No. 223,051
Claims priority, application Japan, Apr. 28, 1980, 55-56594
Int. Cl.³ C07F *9/15*; C08K *5/52*; C09K *15/32*
U.S. Cl. 524—120 **51 Claims**

1. 2,6-Di-tertiary butyl phenyl pentaerythritol spiro bis-phosphites having the structure:



wherein:

R is alkyl having from one to six carbon atoms;

R_1 is methyl or ethyl; and

R_2 is selected from the group consisting of alkyl having from one up to about eighteen carbon atoms; cycloalkyl having from three up to about twelve carbon atoms; and alkaryl and aryl having from six to about thirty carbon atoms; such groups substituted with from one to about four oxy ether-O- and/or carboxylic ester-COO-groups; the residue of a polyhydric alcohol having from two to about eighteen carbon atoms, and from two to about ten hydroxyl groups; and the residue of a polyphenol having from six to about eighteen carbon atoms and from two to about ten phenolic hydroxyl groups.

30. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a phosphite in accordance with claim **1**.

4,371,648

COMPOSITION CONTAINING FURFURYL ALCOHOL AND USE THEREOF IN FOUNDRY BINDERS

John J. Gardikes, Worthington, and Young D. Kim, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 12, 1980, Ser. No. 148,887
Int. Cl.³ B28B *7/34*
U.S. Cl. 523—144 **23 Claims**

1. A composition containing a binder component comprising at least about 20 weight % furfuryl alcohol and an ester of a polyol and a resin acid in an amount of at least about 5% by weight based upon the total of said binder component and ester and a modifying agent for the furfuryl alcohol selected from the group of furan polymers, urea-formaldehyde polymers, or mixtures thereof.

4,371,649

PROCESS FOR BINDING AGGREGATES WITH A VACUUM-ACTIVATED CATALYST

Eduardo Iglesias Hernandez, Carretera Navarra Epele, 39, Hernani (Guipuzcoa), Spain

Filed Jul. 16, 1981, Ser. No. 283,943
Claims priority, application Spain, Jul. 22, 1980, 493,602
Int. Cl.³ C08L *61/14*, *61/10*
U.S. Cl. 523—145 **5 Claims**

1. A process of binding aggregates, which comprises:

mixing the aggregates with a resin binder for said aggregates and a vacuum-activated catalyst for curing said binder, said catalyst being an acid neutralized with a base, which base is capable of being eliminated under application of a vacuum to a maximum residual pressure of 300 mm of mercury;

applying a vacuum, to a maximum residual pressure of 300 mm of mercury, to the mixture comprising said aggregates, binder and catalyst, to eliminate said base and thus activate said catalyst; and

curing said binder at a temperature of 50° to 100° C.

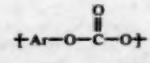
4,371,650

FLAME RETARDANT POLYCARBONATES

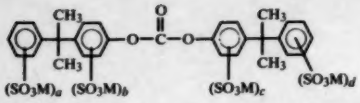
Niles R. Rosenquist, Evansville, and John A. Tyrell, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 26, 1981, Ser. No. 247,941
Int. Cl.³ C08K *5/42*
U.S. Cl. 524—162 **10 Claims**

1. A composition which comprises a polymer having a repeating unit



wherein Ar is an aromatic group, in admixture with a flame retardant effective amount of a mixture of compounds, said mixture comprising at least 2 compounds of the formula



wherein M is an alkali or alkaline earth metal, and a, b, c and d are the same or different and are 0, 1 or 2 with the proviso that at least one of a, b, c or d is 1 or 2.

4,371,651

STABILIZER COMPOSITIONS AND POLYVINYL HALIDE RESIN COMPOSITIONS CONTAINING 1,3-DICARBONYL COMPOUNDS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Kouji Tsuruga, Omiya, Japan, and Masashi Harada, Yokohama, Japan, assignors to Phoenix Chemical Corporation, Atlantic Beach, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,582

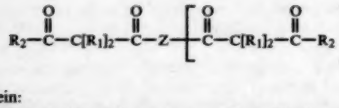
Claims priority, application Japan, Aug. 14, 1980, 55-112303

Int. Cl.³ C08K *5/07;* **C09K** *15/06*

U.S. Cl. 524—178 **6 Claims**

1. A polyvinyl halide resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl halide resin formed at least in part of the recurring group:

and having a halogen content in excess of 40%, where X_1 is halogen and X_2 is either hydrogen or halogen, and a 1,3-dicarbonyl compound having the formula:



wherein:

R_1 is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl alkyl having from one to about eighteen carbon atoms, and

R_2 is selected from the group consisting of hydrocarbon having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl alkyl having from one to about eighteen carbon atoms;

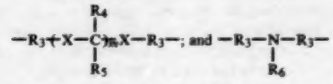
one R_1 and R_2 may be linked together as an alkylene group to form a cyclic or ring structure;

n is a number from 1 to 3; and

Z is a polyvalent linking radical selected from the group consisting of a direct linkage between the

groups;

polyvalent hydrocarbon R_3;



wherein:

R_3 is a polyvalent hydrocarbon group having from one to about eighteen carbon atoms;

R_4 and R_5 are selected from the group consisting of hydrogen and hydrocarbon groups having from one to about eighteen carbon atoms; and R_4 and R_5 may be linked together as an alkylene to form a cyclic or ring structure;

X is —O— or —S—;

m is 0 or 1; and

R_6 is selected from the group consisting of hydrogen, hydrocarbon having from one to about eighteen carbon atoms, and —R_3—; or metal and organotin enolate salts of said 1,3-dicarbonyl compounds.

4,371,652

BLEND COMPOUNDS OF SULFONATED POLYMERS AND COMPOSITIONS THEREOF

Pawan K. Agarwal, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

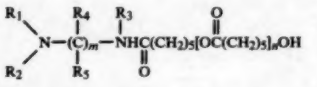
Filed Dec. 21, 1981, Ser. No. 333,128

Int. Cl.³ C08L *23/32*

U.S. Cl. 524—216 **15 Claims**

1. A blend compound which comprises a blend of:

(a) A sulfonated polymer which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:



wherein R_1 or R_2 is an alkyl, cycloalkyl or aryl group, R_3, R_4 and R_5 are a hydrogen or alkyl, cycloalkyl, or aryl groups, m equals 1 to 20 and n equals about 1 to about 500; and

(b) acrylate or methacrylate polymer.

4,371,653

METHOD OF IMPROVING THE ELECTRICAL PROPERTIES OF POLYMERIC INSULATIONS CONTAINING POLAR ADDITIVES, AND THE IMPROVED POLYMERIC INSULATION PRODUCT THEREOF

Joseph E. Betts, Westport, Conn., and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 6,713, Jan. 26, 1979, Pat. No. 4,209,566, which is a continuation-in-part of Ser. No. 816,855, Jul. 18, 1977, abandoned. This application Aug. 13, 1979, Ser. No. 66,202

Int. Cl.³ C08K *5/02*

U.S. Cl. 524—268 **2 Claims**

1. A halogen-containing flame retardant comprising the heat reaction product of a halogen-containing organic flame retardant and a heat reactive, liquid silicone polymer comprising the product of a combination of a major amount of difunctional

$(CH_3)_2SiO$ monomer units and a minor amount of trifunctional $CH_3SiO_{1.5}$ monomer units.

4,371,654

MOLDING COMPOSITIONS BASED ON ESTER-COMPATIBLE THERMOPLASTIC AND/OR ELASTOMERIC SYNTHETIC RESINS

Paul Spielau, Troisdorf-Eschmar; Horst Vohwinkel, Troisdorf-Eschmar, and Werner Kuhnel, Neunkirchen-Schoneshof, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,504

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022468

Int. Cl.³ C08K 5/12

U.S. Cl. 524—296 17 Claims

1. A molding composition containing an ester-compatible, vinyl resin and/or elastomeric synthetic resin and characterized in that the molding composition further contains DMT distillation residue formed during the manufacture of dimethyl terephthalate by the Witten process.

4,371,655

POLYMER COMPOSITIONS CONTAINING SULFATE GLASSES OR GLASS-CERAMICS

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1981, Ser. No. 335,937

Int. Cl.³ C08L 27/06, 27/08, 33/20

U.S. Cl. 524—423 8 Claims

1. A smoke retared composition comprising:

(A) a smoke retardant amount of finely-divided sulfate glass or sulfate glass-ceramic material or mixture thereof, the said sulfate glass or sulfate glass-ceramic material being comprised of potassium sulfate and zinc sulfate which together form at least 50 mol percent of the glass or glass-ceramic composition, and

(B) at least one polymer selected from the group consisting of vinyl chloride and vinylidene chloride polymers, polychloroprenes, poly(vinyl acetates), and polymers of acrylonitrile alone or with styrene, or mixtures thereof.

4,371,656

METAL SUBSTITUTED ZEOLITES AS STABILIZERS FOR HALOGEN-CONTAINING RESINS

Kohji Kashiwase, Funabashi; Yasuo Machino, Ichikawa; Muneo Mita, Chiba; Tsunenosuke Hiramatsu, Hatogaya; Toshihiko Morishita, Tokyo, and Mitsuo Taniguchi, Funabashi, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd. and Kosei Co., Ltd., both of Tokyo, Japan

Filed Dec. 8, 1980, Ser. No. 214,165

Claims priority, application Japan, Jul. 23, 1980, 55-99835

Int. Cl.³ C08K 3/34; C09K 15/02

U.S. Cl. 524—443 17 Claims

11. A stabilized halogen-containing resin composition comprising a halogen-containing resin and a stabilizer which is a zeolite A substituted with ions of a metallic element belonging to Group II except for zinc or Group IVA of the Periodic Table for Group I (M) metal ion contained in said aluminosilicate and containing 10% by weight or less, as M_2O, of residual Group I metal ions.

4,371,657

CRATER RESISTANT ACRYLIC ENAMEL

David C. Chang, Birmingham, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

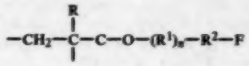
Filed Mar. 4, 1981, Ser. No. 240,573

Int. Cl.³ C08L 61/26

U.S. Cl. 524—512 11 Claims

1. A coating composition comprising about 25–80% by weight of a binder and 20–75% by weight of an organic liquid; wherein the binder comprises

(A) about 40–90% by weight, based on the weight of the binder, of an acrylic polymer having a hydroxyl content about 0.5 to 10% by weight, and consists essentially of an alkyl methacrylate having 1–18 carbon atoms in the alkyl group, an alkyl acrylate having 2–18 carbon atoms in the alkyl group, a hydroxyalkyl acrylate or a hydroxy alkyl methacrylate having 2–4 carbon atoms in the alkyl group up to 5% by weight of an α-β ethylenically unsaturated acid, and contains about 0.5–5% by weight based on the weight of the acrylic polymer, of polymerized perfluorocarbon constituent of the formula



where

R is H or CH_3,

R^1 is an alkyl group containing 2–8 carbon atoms,

n is 0 or 1 and

R^2 is a perfluoroalkyl group containing 4–20 carbon atoms and the polymer has a weight average molecular weight of about 2000–50,000 determined by gel permeation chromatography; and

(B) about 10–60% by weight, based on the weight of the binder, of an alkylated melamine formaldehyde resin.

4,371,658

POLYAMIDE YARN SPIN FINISH CONTAINING A GLYCERIDE AND OXIDIZED POLYETHYLENE

Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 146,588, May 5, 1980, Pat. No. 4,293,460. This application Mar. 2, 1981, Ser. No. 239,835

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ D06M 13/10, 16/00

U.S. Cl. 524—585 46 Claims

1. A spin finish for application to polyamide yarn, the spin finish having a pH of about 7 to 12 and being an oil in water emulsion, the oil portion of which comprises:

about 24.7 to 65 weight percent of a glyceride having an average molecular weight of between about 600 to about 1,000, having a freezing point of between about −6.7° C. to 23.9° C. and being non-resin forming when exposed to temperatures of up to 210° C. for up to 90 seconds; about 5 to 30 weight percent of ethoxylated oleyl alcohol; about 1 to 10 weight percent of ethoxylated nonyl phenol; about 5 to 30 weight percent of ethoxylated castor oil; about 1 to 7.4 weight percent of an oxidized polyethylene; about 0.2 to 2.0 weight percent of a non-nitrogen nonionic emulsifier for the oxidized polyethylene; and about 0.04 to 0.3 weight percent of an alkali hydroxide.

4,371,659

PREPARATION OF AQUEOUS POLYMER DISPERSIONS HAVING A POLYMER CONTENT OF UP TO 75% BY WEIGHT

Wolfgang Druschke, Dirmstein; Albrecht Kerckow, Wachenheim, and Bernd Stanger, Dudenhofen, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,058

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013812

Int. Cl.³ C08L 35/06

U.S. Cl. 524—599 7 Claims

1. In a process for the preparation of aqueous polymer dis-

persions containing up to 75% by weight of polymer by emulsion copolymerization in the presence of conventional anionic emulsifiers, polymerization initiators and small amounts of polymerization inhibitors at conventional polymerization temperatures, the improvement comprising:

copolymerizing a monomer combination selected from the group consisting of vinyl acetate/styrene, methyl methacrylate/vinyl acetate, vinyl chloride/butadiene, vinyl chloride/styrene, methyl methacrylate/vinyl propionate, vinylidene chloride/butadiene, vinylidene chloride/vinyl acetate and vinylidene chloride/methyl methacrylate mixed with from 60 to 95% by weight, based on the total monomers, of at least one monomer B which is copolymerizable with said monomer combination, in the presence of a polymerization initiator, by the emulsion feed process, under conditions such that (a) the initial aqueous phase at the initiation of monomer emulsion feeding contains from 0.01 to 0.5% by weight, based on the initial charge, of anionic emulsifier and from 1 to 7% by weight, based on the initial charge, of water soluble salts, (b) the monomer emulsion contains from 50 to 500 ppm, based on the total monomers, of polymerization inhibitor, (c) from 1 to 10% by weight of the monomer emulsion is added, within the first ½ hour from initiation of emulsion feeding, at an increasing rate of the initial charge, and thereafter (d) the remaining monomer emulsion is added at a rate sufficient to control the rate of reaction.

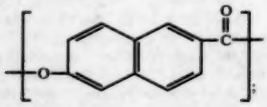
4,371,660
ANISOTROPIC MELT PHASE FORMING POLY(ESTER-CARBONATE) DERIVED FROM 6-HYDROXY-2-NAPTHOIC ACID, AROMATIC DIOL, ORGANIC COMPOUND CAPABLE OF FORMING A CARBONATE LINKAGE, AND, OPTIONALLY, OTHER AROMATIC HYDROXY-ACID AND CARBOCYCLIC DICARBOXYLIC ACID

Gordon W. Calundann, North Plainfield, and Anthony J. East, Madison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 6, 1981, Ser. No. 319,024
Int. Cl.³ C08G *63/64*
U.S. Cl. 524—601 **43 Claims**

1. A melt-processable poly(ester-carbonate) capable of forming an anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of recurring moieties I, II, III, and, optionally, IV and V wherein:

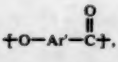
I is



II is O—Ar—O, where Ar is a divalent radical comprising at least one aromatic ring;

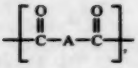
III is

IV is



where Ar' is a divalent radical comprising at least one aromatic ring, other than 2,6-naphthylene; and

V is



where A is a divalent carbocyclic radical, wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures thereof, and wherein moiety I is present in the polymer in a concentration of at lesast approximately 20 mole percent, moiety IV is present in the polymer in a concentration within the range of approximately 0 to 60 mole percent, with the total molar concentration of moieties I and IV in the polymer being within the range of approximately 20 to 80 mole percent, moiety II is present in the polymer in a concentration within the range of approximately 10 to 40 mole percent, moiety III is present in the polymer in a concentration within the range of approximately 10 to 40 mole percent, and moiety V is present in the polymer in a concentration within the range of approximately 0 to 30 mole percent, with the molar concentration of moiety II being substantially equal to the sum of the molar concentrations of moieties III and V.

4,371,661
SEMI-CONTINUOUS PROCESS FOR MAKING STAR-BLOCK COPOLYMERS

Harold L. Nicholson, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 235,243, Feb. 17, 1982, abandoned. This application Mar. 26, 1982, Ser. No. 362,188
Int. Cl.³ C08F *297/04*
U.S. Cl. 525—53 **3 Claims**

1. A semi-continuous process for preparing star-block copolymers of a monovinyl aromatic compound and a conjugated diene in an inert hydrocarbon solvent using an anionic initiator consisting essentially of:

a. charging a first reactor with the solvent and all of the initiator and heating to 70° to 85° C. followed by the addition of, in 3 equal portions, over a period of from 6 to 15 minutes, all of the monovinyl aromatic compound while maintaining the reactor at polymerization temperature to insure complete polymerization of the monovinyl aromatic compound to form blocks of formula A—Li where A is a block of polyvinyl aromatic compound;

b. transferring the contents to a second reactor and charging all of the conjugated diene in 3 equal portions over a period of 27 to 55 minutes while maintaining said second reactor at a temperature of from 65° to 80° C. to insure complete polymerization of the diene to form chains of formula A-B-Li where B is a block of polydiene;

c. transferring the contents of said second reactor to a third reactor and charging 0.6 to 3.5 parts by weight of coupling agent per 100 parts by weight of total monomer and allowing to couple at 70°–80° C. for 30 to 60 minutes to form star-block copolymer having formula $(A—B)_m—X$ where A and B are block segments, as above, m is an integer between 3 and 20, and X is the radical of a polyfunctional coupling agent;

d. transferring the contents of said third reactor to a fourth reactor, terminating the polymerization by the addition of methanol, adding stabilizers and recovering the polymer by extrusion into polymer pellets; and

e. repeating steps a–d as soon as each reactor is emptied into the succeeding reactor.

4,371,662

THREE-COMPONENT RESIN COMPOSITIONS HAVING IMPROVED COATING PROPERTIES

Fumihiro Tone, and Toshihiko Fujishima, both of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,399
Claims priority, application Japan, Sep. 1, 1980, 55/119696; Sep. 13, 1980, 55/127539; Sep. 13, 1980, 55/127540
Int. Cl.³ C08L 23/16, 53/02, 53/00
U.S. Cl. 525—89 7 Claims

1. A resin composition having improved coating properties which comprises (A) 67 to 91% by weight of an ethylene-propylene block copolymer, (B) 33 to 9% by weight of an ethylene-propylene rubber having a Mooney viscosity (ML_{1+4}, 100° C.) of 18 to 34, and (C) 3 to 15 parts by weight of a styrene-based elastomer selected from the group consisting of styrene-butadiene-styrene block copolymers, styrene-isoprene-styrene block copolymers, and styrene-ethylene-butylene-styrene block copolymers, per 100 parts by weight of the total of Components (A) and (B).

4,371,663

PHYSICALLY-AMELIORATED STYRENE POLYMER/THERMOPLASTIC ELASTOMER POLYBLENDS

Robert J. Russell, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 30, 1979, Ser. No. 99,177
Int. Cl.³ C08L 53/00
U.S. Cl. 525—95 25 Claims

1. A polyblended composition or polyblend particularly well characterized in having outstanding environmental stress crack resistance comprising, in intimate admixture:

(a) a styrene polymer containing polymerized therein at least about 60 percent by weight, of at least one alkenyl aromatic monomer of the Formula:

$$CH_2{=}CGAr, \qquad (I)$$

wherein G is selected from the group consisting of hydrogen and methyl and Ar is an aromatic radical, selected from the group consisting of benzene alkyl, and halo-ring-substituted aromatic units of from 6 to about 10 carbon atoms, with any balance of unsaturated material copolymerized with the Formula (I) monomer is said styrene polymer being at least one other ethylenically-unsaturated material that is copolymerizable with styrene; and

(b) a thermoplastic rubbery elastomer block copolymer which is comprised of:

at least one elastomer block of synthetic rubber connected to

at least one styrene polymer block, the styrene polymer of said block being hereinbefore defined;

said thermoplastic rubbery elastomer block copolymer being comprised of at least about 20 weight percent of said elastomer block with the balance being said styrene polymer block;

the styrene polymer and the elastomer block copolymer together containing at least about 40 weight percent of the styrene polymer therein with the balance being said thermoplastic elastomer block copolymer;

(c) between about 50 and about 1,000 parts per million by weight based on total polyblend composition weight of a thermally-activatable, peroxy oxygen-containing organic peroxide which is miscible in and with said styrene polymer and block copolymer which has in its general structure at least one of the characterizing linkage units of the Formula:

$$—O—O—, \qquad (III)$$

wherein the entire organic peroxide contains from 2 to about 30 carbon atoms in its general structure and is thermally decomposable at a temperature in the range that is greater than about 100° C. less than that at which thermal degradation of the involved styrene polymer block copolymer occurs, the peroxy oxygen containing organic peroxide being present in a crosslink promoting effectively reactive quantity

(d) at least one material that is inter-reactive with the rubber elastomer constituent in said styrene polymer block copolymer polyblends under influence of said peroxide, which material is selected from the group consisting of:

(d.1) an alkenyl aromatic monomer of Formula (I) and mixtures thereof incorporated in the polyblend composition in an amount between about 0.5 and about 3 weight percent.

4,371,664

VINYL RESIN COMPOSITION CONTAINING SILYL GROUPS

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 16, 1981, Ser. No. 302,546
Claims priority, application Japan, Sep. 19, 1980, 55-131146
Int. Cl.³ C08F 8/00
U.S. Cl. 525—100 18 Claims

1. A composition comprising 100 parts by weight of a vinyl resin having a backbone chain composed substantially of a vinyl polymer, including in each molecule at least one silyl group of which silicon links to a hydrolyzable group or groups, and containing 0.1 to 20% by weight of a carboxylic acid amide having a polymerizable group as a component of the polymer and 0.01 to 10 parts by weight of a curing catalyst.

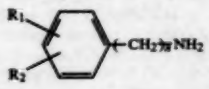
4,371,665

MODIFIED EPOXY RESIN COMPOSITION

Minoru Hino, Takatsuki, and Takao Oshima, Otsu, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Tohto Kasei Co., Ltd., Tokyo, both of, Japan

Filed Dec. 22, 1981, Ser. No. 333,454
Claims priority, application Japan, Dec. 29, 1980, 55-185573
Int. Cl.³ C08L 63/00
U.S. Cl. 525—109 6 Claims

1. A modified epoxy resin composition, which comprises an epoxy resin and a modified adduct [D] of a conjugated diene polymer or copolymer which has an imido bond and/or amido bond and a semi-ester structure and has an acid value owing to a free carboxyl group of 5 to 100, said modified adduct being obtained by reacting an adduct [A] of a polymer of a conjugated diene having a number average molecular weight of 300 to 20,000 or a copolymer of the conjugated diene and vinyl monomer with an α,β-unsaturated dicarboxylic acid or its anhydride, with a compound [B] of the formula:



[I]

wherein R_1 and R_2 are the same or different and are each hydrogen, an alkyl having 1 to 5 carbon atoms, a halogen, cyano, hydroxy, thiol, methoxy, —$CONH_2$, —$COCH_3$, —$COOCH_3$, or —$N(CH_3)_2$, and n is an integer of 0 to 3, and a compound [C] of the formula:

$$R_3\text{-}(\text{-}CH_2\text{-})_n OH \qquad [II]$$

wherein R_3 is a saturated or unsaturated hydrocarbon group having 1 to 18 carbon atoms; a saturated or unsaturated hydrocarbon having 1 to 12 carbon atoms and containing cyano, a halogen, an ether bond, an ester bond or a hydroxy group which bonds to a secondary or tertiary carbon; a saturated

alcohol residue having 1 to 8 carbon atoms; acrylic acid residue; and m is an integer of from 0 to 3.

4,371,666

COMPATIBLE BLENDS OF CHLORINATED POLYVINYL CHLORIDE RESINS AND STYRENE-MALEIC ANHYDRIDE RESINS

Larry G. Bourland, Downington, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1981, Ser. No. 293,562

Int. Cl.³ C08L 25/08, 27/24

U.S. Cl. 525—207 **11 Claims**

1. A compatible blend of thermoplastic polymers consisting assentially of: (a) from 1–99 percent by weight of a chlorinated polyvinyl chloride resin; and (b) from 1–99 percent by weight of a copolymer consisting of a vinyl aromatic monomer and an ethylenically unsaturated dicarboxylic acid monomer; said blend having a heat distortion temperature in excesss of 200° F., and a single glass transition property.

4,371,667

BAKING LACQU...R

Dieter Möller, Ascheberg, and Ulrich Poth, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,531

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3022996

Int. Cl.³ C08L 37/00, 41/00

U.S. Cl. 525—208 **6 Claims**

1. In a liquid coating composition having as the essential organic film-forming component thereof, a heat-curable mixture of:

A. an organic solvent-soluble acidic copolymer of a plurality of polymerizable alpha,beta-monoethylenically unsaturated monomers consisting essentially of

(1) at least one member selected from the group consisting of alpha,beta-monoethylenically unsaturated hydrocarbons;

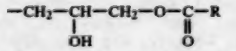
(2) alkanol esters of alpha,beta-monoethylenically unsaturated monocarboxylic acids; and

(3) an alpha,beta-monoethylenically unsaturated carboxylic acid having from one to two—COOH moieties per molecule in a proportion sufficient to provide said acidic polymer with a carboxylic acid number in the range of 10 to 150; and

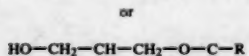
B. an organic solvent-soluble epoxy functional copolymer of a plurality of polymerizable alpha,beta-monoethylenically unsaturated monomers;

the improvement comprising:

(1) said acidic copolymer (A), wherein 1000 g thereof contain 0.5 to 3 moles of alpha,beta-monoethylenically unsaturated carboxylic acid and 0.6 to 2 moles of alpha,beta-monoethylenically unsaturated carboxylic acid monomer units esterified with a structure selected from the group consisting of:



or



wherein R is a saturated or unsaturated aliphatic hydrocarbon radical having 1 to 26 carbon atoms, or a branched chain of the formula

where R_1, R_2 and R_3 are an H atom or saturated or unsaturated aliphatic hydrocarbon radicals having a straight chain of 1 to 12 carbon atoms; and

(2) said epoxy functional polymer (B) is a copolymer of at least one member selected from the group consisting of alpha,beta-monoethylenically unsaturated hydrocarbons, alkanol esters of alpha,beta-monoethylenically unsaturated monocarboxylic acids, and glycidyl esters of alpha,-beta-monoethylenically unsaturated monocarboxylic acids in sufficient proportion to provide said epoxy copolymer with an epoxy equivalent weight of from 120 to 2000; and

(3) the relative proportions of said acidic copolymer (A) and said epoxy copolymer (B) are 0.5 to 1.5 carboxylic groups of the copolymer (A) per epoxy group of the copolymer (B); and

(4) said heat-curable mixture is in solution in a volatile liquid comprising an organic solvent therefor.

4,371,668

RUBBER COMPOUND CAPABLE OF GIVING A VULCANIZED RUBBER HAVING A HIGH MODULUS OF ELASTICITY

Hiroharu Ikeda, Machida, and Yasuyuki Shimozato, Yokohama, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 37,778, May 10, 1979, Pat. No. 4,281,085. This application Mar. 9, 1981, Ser. No. 242,031

Claims priority, application Japan, May 12, 1978, 53-55526; Feb. 14, 1979, 54-14958

Int. Cl.³ C08F 126/00, 126/06

U.S. Cl. 525—133 **17 Claims**

1. A rubber compound, which comprises:

(I) 100 parts by weight of a rubber component,

(II) 0.1–15 parts by weight of an amine salt of a carboxylic acid, and

(III) 0–7 parts by weight of sulfur; said rubber component (I) comprising:

(A) at least 40% by weight of an elastomeric copolymer composed of from 80–99.5% by weight of a monomer mixture of a C_4 or C_5 conjugated diene and styrene and from 0.5–20% by weight of a glycidyl group containing monomer, with the total amount of the conjugated diene in said copolymer being at least 50% by weight; and

(B) 60% by weight or less of a vulcanizable rubber selected from the group consisting of natural rubber, polyisoprene, polybutadiene, styrene-butadiene rubber, ethylene-propylene rubber, butyl rubber, chloroprene rubber and nitrile rubber.

4,371,669

POLYMERS HAVING IMPROVED WATER RESISTANCE AND MONOMERS FOR SAME

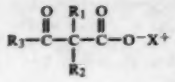
Stamatios G. Mylonakis, Barrington, and Anthony J. Tortorello, Elmhurst, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 11,701, Feb. 12, 1979, Pat. No. 4,275,229. This application Dec. 29, 1980, Ser. No. 220,268

Int. Cl.³ C08F 16/36

U.S. Cl. 526—311 **10 Claims**

1. A carboxy functional, addition copolymer prepared from a first monoethylenically unsaturated monomer having the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_1–C_8 alkyl;

R_2 is selected from the group consisting of hydrogen, C_1–C_8 alkyl and a vinyl-containing radical;

R_3 is selected from the group consisting of C_1–C_8 alkyl; a vinyl containing radical; O-R_4 where R_4 is hydrogen, C_1–C_8 alkyl or X^+; and NR_5R_6 where R_5 and R_6 are hydrogen or C_1–C_8 alkyl; and one of R_2 or R_3 is a vinyl containing radical; and

X^+ is selected from the group consisting of the proton, protonated ammonia, protonated amines, and mixtures thereof; and

at least a second monethylenically unsaturated monomer copolymerizable therewith, the vinyl containing radical referred to for components R_2 and R_3 being selected from the group consisting of vinyl benzyl, allyl, allyl derivatives of allyl alcohol or allylamines, vinyl, acrylyloxy and methacrylyloxy.

4,371,670

COPOLYMERS HAVING A BACKBONE OF ALTERNATING POLYMER BLOCKS AND SILICON UNITS

Le-Khac Bi, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 26, 1981, Ser. No. 238,297
Int. Cl.³ C08L *83/00*
U.S. Cl. 525—342 **9 Claims**

1. An alternating copolymer having the formula

wherein each R separately represents hydrogen, a (C_1 to C_4) alkyl group or a phenyl group; W represents at least one monomer selected from the group consisting of dienes, styrenes, vinylidene chloride, vinyl esters, acrylic and methacrylic esters and acrylonitrile; n represents an integer from 2 to 300; and, m represents an integer from 2 to 50 and wherein said copolymer is solid.

4,371,671

CONTROLLED, ELEVATED PRESSURE DEHYDRATION OF POLY(ARYLENE SULFIDE) PREPOLYMERIZATION MIXTURE

Kenneth L. Anderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1981, Ser. No. 298,441
Int. Cl.³ C08G *75/14*
U.S. Cl. 528—388 **12 Claims**

1. A method in the preparation of poly(arylene sulfide) for dehydrating pre-polymerization mixtures comprising a reaction mixture of a sulfur source and an organic amide, said method comprising:

(a) contacting a reaction mixture comprising a sulfur source and an organic amide at an essentially constant pressure within a range of about 4 psig to about 40 psig and a first temperature in the range of about 300° F. to about 400° F. for a time sufficient for formation of a complex of the reactants, and subsequently

(b) maintaining the essentially constant pressure while over a period of time raising the temperature to a second temperature, at which, at said essentially constant pressure, essentially all water is removed from the mixture.

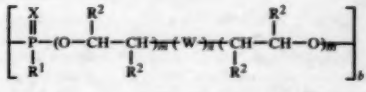
4,371,672

THERMOPLASTIC MOLDING COMPOSITION

Usama E. Younes, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1981, Ser. No. 329,158
Int. Cl.³ C08G *65/48*; C08L *71/04*
U.S. Cl. 525—391 **2 Claims**

1. A thermoplastic molding composition comprising two thermoplastic polymers which are at least partially miscible in one another, one polymer being polyphenylene oxide and the other polymer being an alternating copolymer having the formula:



wherein R^1 represents a halogen, a (C_1 to C_{10}) alkyl or halogenated (C_1 to C_{10}) alkyl group, hydroxy, a (C_1 to C_{10}) alkoxy or halogenated (C_1 to C_{10}) alkoxy group, an aryl or halogenated aryl group, and an aryloxy or halogenated aryloxy group; X may or may not be present and represents oxygen or sulfur; W represents at least one monomer selected from the group consisting of dienes, styrenes, vinylidene chloride, vinyl esters, and acrylonitrile; each R^2 separately represents hydrogen, a (C_1 to C_4) alkyl group, or an aryl group; n represents an integer equal to or greater than 2; each m separately represents an integer from 1 to 20, and b represents an integer from 2 to 1000.

4,371,673

WATER SOLUBLE FORMS OF RETINOIDS

Josef Pitha, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jul. 21, 1980, Ser. No. 170,570
Int. Cl.³ C08G *69/48*; C08B *37/16*
U.S. Cl. 525—426 **21 Claims**

1. A water soluble material comprising a cyclodextrin complex of the product formed by the reaction of a polymer and a retinoid, wherein said polymer contains polar or ionic functional groups.

4,371,674

WATER SOLUBLE CROSSLINKED ETHYLENEIMINE GRAFTED POLYAMIDOAMINE

Otto Hertel, 68 Koenigsbacher Strasse; Emil Scharf, 51 Mohnstrasse; Jaroslav Melzer, 116 Kirchenstrasse, and Rolf Fikentscher, 27 Von-Stephan-Strasse, all of 6700 Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,479
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934854
Int. Cl.³ C08G *69/48*
U.S. Cl. 525—435 **2 Claims**

1. An improved process for the preparation of a water-soluble papermaking auxiliary, to be used as a drainage aid, flocculant, or retention aid, comprising reacting

(a) 1 part by weight of a polyamidoamine, obtained by condensing 1 mole of a dicarboxylic acid of 4 to 10 carbon atoms with 0.8–1.4 moles of a polyalkylenepolyamine having 3–10 alkyleneimine units to give a primary product followed by grafting from 2 to 8 ethyleneimine units per basic nitrogen of the primary product onto the primary product in the presence of a catalyst selected from the group consisting of acids, Lewis acids, and compounds which generate an acid during said grafting, with

(b) 0.1–4 parts by weight of a crosslinking agent at above 20° C. in aqueous solution or in a water-soluble organic solvent to give said auxiliary, the reaction being continued until the viscosity of an aqueous solution containing 20% by weight of the auxiliary is from 300 to 2,500 milliPascal seconds,

wherein the crosslinking agent is an α,ω-dichloropolyalkylene oxide obtained by reacting a polyalkylene oxide containing 8–100 alkylene oxide units with a compound selected from the group consisting of thionyl chloride and phosgene to give a reaction product and then cleaving the reaction product by heating the reaction product at from 70° to 150° C. in the presence of a tertiary amine catalyst.

4,371,675

PROCESS FOR PREPARATION OF MODIFIED AROMATIC HYDROCARBON RESIN

Akira Miyamoto, Hiratsuka; Masayoshi Maeda, Nishinomiya, and Yoshitaka Yamagishi, Hiratsuka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,136

Claims priority, application Japan, Apr. 28, 1980, 55/56743

Int. Cl.³ C08G *10/04;* C08J *3/00*

U.S. Cl. 525—472 **8 Claims**

1. In a process for the preparation of a modified aromatic hydrocarbon resin by reacting an aromatic hydrocarbon-formaldehyde resin with an unsaturated polybasic acid or an anhydride thereof, optionally together with a saturated polybasic acid or an anhydride thereof, the improvement which comprises reacting 10 to 35 parts by weight of an unsaturated polybasic acid or an anhydride thereof with 100 parts by weight of an aromatic hydrocarbon-formaldehyde resin in the presence of 5 to 50 parts by weight of water or water and aliphatic alcohol per 100 parts by weight of the aromatic hydrocarbon-formaldehyde resin, while removing formaldehyde solution formed by the reaction to the outside of the reaction system during the reaction by raising the temperature to 190° to 220° C. for at least one hour.

4,371,676

PREPARATION OF CYCLOPENTADIENE/ACETYLENICALLY UNSATURATED COMPOUND COPOLYMERS

Richard Hoene, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,920

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017619

Int. Cl.³ C08F *38/00, 36/00*

U.S. Cl. 526—76 **3 Claims**

1. A process for the preparation of a cyclopentadiene copolymer which comprises: polymerizing

(a) from 10 to 99% by weight of cyclopentadiene, dicyclopentadiene, tricyclopentadiene, their C_1–C_3-alkyl derivatives or co-dimers of cyclopentadiene with a diene of 4 or 5 carbon atoms,

(b) from 1 to 50% by weight of at least one acetylenically unsaturated compound which in addition to one or more alkynyl groups contains one or more hydroxyl, amino, carboxyl, aldehyde, alkyl, aryl or aralkyl groups or halogen atoms and

(c) from 0 to 40% by weight of other copolymerizable olefinically unsaturated monomers,

at a temperature of from 200° to 320° C., either thermally or with addition of a source of free radicals, the sum of the percentages (a), (b) and (c) being 100.

4,371,677

PROCESS FOR MAKING DISPERSION COPOLYMERS THROUGH MONOMER METERING

Marion G. Morningstar, Avon Lake, and Thomas J. Doyle, Lorain, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Sep. 14, 1981, Ser. No. 301,618

Int. Cl.³ C08K *5/05*

U.S. Cl. 526—80 **20 Claims**

1. A process for producing vinyl dispersion copolymers of vinyl and vinylidene halides with a comonomer selected from the group consisting of acrylic acid, methacrylic acid, esters of acrylic acid, and esters of methacrylic acid, comprising forming a monomer premix containing a vinyl or vinylidene halide, the aqueous reaction medium, from about 0.02% to about 0.4% by weight of a free radical yielding initiator(s) based on the weight of 100 parts of monomer being copolymerized, at least one emulsifier, and at least one long straight chain saturated alcohol containing from 8 to 24 carbon atoms, the ratio of alcohol to emulsifier being in the range of about 0.25 to about 2.5, homogenizing said premix below the reactivity of the catalyst(s) employed, passing said homogenized premix to a reaction zone, emulsion polymerizing said homogenized premix in said zone at a temperature in the range of about 35° C. to about 60° C., metering said comonomer into said reaction zone during the polymerization reaction, said metering being substantially stopped prior to about 2 hours prior to the completion of the reaction, and thereafter recovering the copolymer.

4,371,678

PROCESS FOR RAPIDLY TERMINATING THE POLYMERIZATION OF VINYL CHLORIDE IN AQUEOUS SUSPENSION

Stephane Noël, Grimbergen, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Jun. 4, 1981, Ser. No. 270,581

Claims priority, application France, Jun. 5, 1980, 80 12724

Int. Cl.³ C08F *2/42, 2/20*

U.S. Cl. 526—83 **5 Claims**

1. Process for rapidly terminating the polymerisation of vinyl chloride in aqueous suspension in the presence of a lower dialkyl peroxydicarbonate, comprising introducing into the aqueous suspension amounts of ammonium hydroxide and a thiosulfate of an alkali of metal or ammonium sufficient to effectively terminate the polymerisation.

4,371,679

PROCESS FOR PREPARING POLYOLEFINS

Nobuyuki Kuroda, Yokohama; Akira Sano, Kawasaki; Toru Nakamura, Kawasaki; Kazuo Matsuura, Kawasaki, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 45,859, Jun. 6, 1979, abandoned. This application Jan. 28, 1981, Ser. No. 229,167

Claims priority, application Japan, Jun. 21, 1978, 53-74171

Int. Cl.³ C08F *4/02, 4/64, 4/58*

U.S. Cl. 526—116 **15 Claims**

1. A process for the preparation of polyolefins by polymerizing olefins using a titanium containing solid component together with an organometallic compound, said solid component comprising a substance obtained by copulverizing (1) magnesium halide, maganese halide or mixtures thereof, (2) an organic halide compound which is a saturated or unsaturated aliphatic or aromatic hydrocarbon in which at least one of the hydrogens is substituted with halogen, (3) a chain or cyclic silicone compound with recurring structural units represented by the general formula:

wherein R′ and R″ respectively represent hydrogen, alkyl, aryl, alkoxy, or hydroxyl groups and (4) a tetravalent or trivalent titanium compound or mixtures thereof; the weight ratio of magnesium halide, maganese halide or mixtures thereof to organic halide being from 0.5:0.01 to 1:0.01; the weight ratio of magnesium halide, manganese halide or mixtures thereof to silicone compound being from 1:0.5 to 1:0.005; the amount of titanium compound in the solid component being from 0.5 to 10% by weight; said organometallic compound being selected from the group consisting of organoaluminum compounds of the general formulae R_3Al, R_2AlX, $RAlX_2$, R_2AlOR, $RAl(OR)X$ and $R_3Al_2X_3$ wherein R which may be the same or different in a specific compound is an alkyl or aryl group and X is a halogen atom, and organozinc compounds of the general formula R_2Zn wherein R which may be the same or different in a specific compound is an alkyl group.

4,371,680

POLYMER COMPOSITION

Warren N. Baxter, Orange, Tex.; Nicholas G. Merekling, deceased, late of Wilmington, Del.; by Noelle K. Masukawa, administratrix, Wauwatosa, Wis.; Ivan M. Robinson, Wilmington, and Gelu S. Stamatoff, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 556,548, Dec. 30, 1955, abandoned, Continuation-in-part of Ser. No. 451,064, Aug. 19, 1954, abandoned, and Ser. No. 517,398, Jun. 22, 1955, abandoned. This application Jan. 22, 1968, Ser. No. 708,718

Int. Cl.³ C08F *4/64, 4/68, 210/02*

U.S. Cl. 526—159 **3 Claims**

1. A process which comprises interpolymerizing monomers comprising ethylene and propylene in the presence of a polymerization catalyst formed by mixing an organometal compound consisting of a metal alkyl or metal aryl of a metal selected from the group consisting of metals of Groups II and III of the Periodic System; zinc metal or metals above zinc in the electromotive series with a compound, other than the oxide, of a metal selected from the group consisting of titanium, zirconium, vanadium, tantalum, chromium, molybdenum, and tungsten, and recovering the solid polymer formed.

4,371,681

BROMINE CONTAINING ALLYLCARBONATES

Aaron Liebersohn, Derech Mazada 95, Beer Sheva, Israel

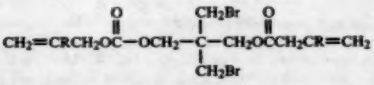
Filed Oct. 29, 1981, Ser. No. 316,412

Claims priority, application Israel, Nov. 21, 1980, 61529

Int. Cl.³ C08L *85/00, 69/00*

U.S. Cl. 526—295 **7 Claims**

1. Compounds of the formula



wherein R is —H or —CH_3.

4,371,682

ROOM TEMPERATURE CURABLE POLYORGANOSILOXANE COMPOSITION AND METHOD

Mitsuyoshi Hashimoto, Ojima, Japan, assignor to Toshiba Silicones, Ltd., Japan

Filed Jun. 17, 1981, Ser. No. 274,617

Claims priority, application Japan, Jun. 17, 1980, 55-81999

Int. Cl.³ C08G *77/04*

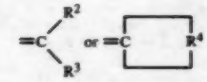
U.S. Cl. 528—34 **22 Claims**

1. A room temperature curing polyorganosiloxane composition comprising: (A) 100 parts by weight of a silanol-terminated polydiorganosiloxane having a viscosity of 500 to 200,000 centistokes at 25° C., (B) 0.5–25 parts by weight of an oxime radical-methoxyl radical exchange reaction product obtained from:

(1) an oxime radical-containing organosilicon compound selected from the group consisting of oxime radical-containing silanes of the general formula:

$$R_a^1Si(ON{=}Q)_{4-a}$$

wherein R^1 represents a substituted or unsubstituted monovalent hydrocarbon radical, =Q represents a bivalent radical of the formula:



R^2 and R^3 respectively represent a monovalent radical selected from the group consisting of hydrogen atoms and substituted or unsubstituted monovalent hydrocarbon radicals, R^4 represents an alkylene radical of 4 to 6 carbon atoms, and a represents a number of 0 or 1 and partially hydrolyzed condensates thereof, and (2) a methoxyl radical-containing organosilicon compound selected from the group consisting of methoxyl radical-containing silanes of the general formula:

$$R_b^5Si(OCH_3)_{4-b}$$

wherein R^5 represents a substituted or unsubstituted monovalent hydrocarbon radical, and b represents a number of 0 or 1 and partially hydrolyzed condensates thereof, in such amounts that a molar ratio of the oxime radical bonded with the silicon atom will be 1:(0.2–2.0); and

(C) 0.01 to 10 parts by weight of a catalyst for promoting the reaction of (A) and (B).

4,371,683

HARDENABLE ADHESIVE

Jürgen Fock, Düsseldorf; Dietmar Schedlitzki, Essen; Ulrich Holtschmidt, Essen, and Wilhelm Ahrens, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,292

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113014

Int. Cl.³ C08G *18/48*

U.S. Cl. 528—60 **11 Claims**

1. A hardenable adhesive comprising at least one polyol, one polyisocyanate or their prepolymers wherein the polyol is the reaction product of a novolak of average molecular weight from 300 to 1200 with an oxirane having the general formula

in which R^1 is hydrogen, a halogenated hydrocarbon group with 1 to 4 carbon atoms or the $—CH_2OR^2$ group, in which R^2 represents an alkyl or an alkenyl group, the R^1 group within the polymeric molecule being the same or different,

and having on the average 1 to 7 moles of the oxirane per hydroxyl group of the novolak,

the polyol and the polyisocyanate being present in such a ratio that 0.95 to 1.25 isocyanate groups of the polyisocyanate correspond to one hydroxyl group of the polyol.

4,371,684
THERMOPLASTIC POLYURETHANES FOR PROCESSING IN EXTRUDERS AND/OR ON CALENDERS

Bernd Quiring, Leverkusen; Georg Niederdellmann, Dormagen; Wilhelm Goyert, Cologne, and Hans Wagner, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 140,074, Apr. 14, 1980, abandoned, which is a continuation of Ser. No. 29,958, Apr. 13, 1979, abandoned. This application May 29, 1981, Ser. No. 271,308

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817457

Int. Cl.³ C08G *18/42*

U.S. Cl. 528—65 **7 Claims**

1. In the processing of thermoplastic polyurethanes in extruders and/or melt roll calenders, the improvement wherein the polyurethanes used are synthesized from

(A) one or more relatively high molecular weight substantially linear polyols having molecular weights in the range from 400 to 10,000 selected from the group consisting of hydroxyl-group-containing polyesters of glycols and adipic acid, phthalic and/or terephthalic acid and their hydrogenation products, hydroxyl polycarbonates, polycaprolactones, polyethylene oxide and polypropylene oxide started with glycols, amines and/or water and polytetrahydrofuran,

(B) diphenyl methane diisocyanate and/or hexamethylene diisocyanate and

(C) a mixture of 85 to 99% by weight of 1,4-butane diol and 1 to 15% by weight of at least one co-extender selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, diethylene-1,2-propane diol, 1,3-butane diol, 1,6-hexane diol, 2-ethyl-1,3-hexane diol, 2,2-dimethyl-1,3-propane diol, 1,4-bis-hydroxymethyl cyclohexane, hydroquinone-bis-hydroxyethyl ether, and mixtures thereof, the equivalent ratio of

NCO groups in component (B) to the Zerewitinoff-active hydrogen atoms in components (A) and (C) being from 0.9:1 to 1.2:1 and the molar ratio of component (A) to (C) being from 1:20 to 5:1.

4,371,685
RADIATION-REACTIVE PRECURSOR STAGES OF HIGHLY HEAT-RESISTANT POLYMERS

Hellmut Ahne, Röttenbach; Eberhard Kühn, Hemhofen, and Roland Rubner, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,637

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021748

Int. Cl.³ G03C *1/68*

U.S. Cl. 528—73 **17 Claims**

1. A radiation-reactive oligomeric and/or polymeric compound which is a precursor of a heterocyclic-based polymer and which is capable of being converted by radiation to said heterocyclic-based polymer, said oligomeric and/or polymeric compound consisting of the addition product of (a) a cyclic carboxylic acid anhydride and (b) a hydroxyl group-containing compound, said hydroxyl group-containing compound itself being an oligomeric and/or polymeric radiation-reactive precursor and consisting of an addition product of (a) an olefinically unsaturated monoepoxide and (b) a member selected from the group consisting of:

(1) a carboxyl group-containing polyaddition product of (i) an aromatic and/or heterocyclic tetracarboxylic acid dianhydride and (ii) a diamino compound or a diamino compound with at least one ortho-position amido group;

(2) a carboxyl group-containing polyaddition product of (i) a member selected from an aromatic and/or heterocyclic dihydroxydicarboxylic acid or an aromatic and/or heterocyclic diaminodicarboxylic acid and (ii) a diisocyanate;

(3) an amino group-containing polycondensation product of (i) an aromatic and/or heterocyclic tetraamino compound and (ii) a dicarboxylic acid chloride ester;

(4) an amino group-containing polyaddition product of (i) an aromatic and/or heterocyclic tetraamino compound and (ii) a tetracarboxylic acid dianhydride; and

(5) a hydroxyl group-containing polycondensation product of (i) an aromatic and/or heterocyclic dihydroxydiamino compound and (ii) a dicarboxylic acid chloride or ester.

4,371,686
ANTITHROMBOGENIC, HIGHLY ELASTIC POLYURETHANE COMPOUND

Noboru Yamamoto, Ikeda, and Iwao Yamashita, Kawanishi, both of Japan, assignors to Agency of Industrial Science & Technology Ministry of International Trade & Industry, Tokyo, Japan

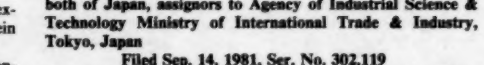
Filed Sep. 14, 1981, Ser. No. 302,119

Claims priority, application Japan, Sep. 12, 1980, 55-127837

Int. Cl.³ C08G *18/32, 18/48*

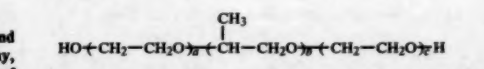
U.S. Cl. 528—76 **9 Claims**

1. An antithrombogenic, highly elastic, uncrosslinked polyurethane compound produced by the reaction of a polyether diol of the general formula:



wherein, a, b, and c each denote a positive integer, having a polyoxyethylene content in the range of from 10 to 50 weight percent and an average molecular weight in the range of from 500 to 5,000, with 1.5 to 4 mols of a diisocyanate per mol of said polyether diol to give a prepolymer followed by reacting said prepolymer with 0.5 to 3 mols of a diamine per mol of said polyether diol to give said uncrosslinked polyurethane.

8. A method for the manufacture of an antithrombogenic film to be deposited as a coating on the surface of a device, which comprises dissolving in a solvent an antithrombogenic, highly elastic, uncrosslinked polyurethane compound produced by the reaction of a polyether diol of the general formula:



wherein, a, b, and c each denote a positive integer, having a polyoxyethylene content in the range of from 10 to 50 weight percent and an average molecular weight in the range of from 500 to 5,000, with 1.5 to 4 mols of a diisocyanate per mol of said polyether diol to give a prepolymer followed by reacting said prepolymer with 0.5 to 3 mols of a diamine per mol of said polyether diol to give uncrosslinked polyurethane, and applying the resultant solution to the surface of a device.

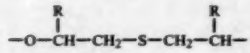
4,371,687

SULFUR-MODIFIED POLYTETRAMETHYLENE ETHER GLYCOLS, A METHOD FOR PREPARING THEM, AND POLYURETHANES PREPARED THEREFROM

Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 7, 1981, Ser. No. 281,198
Int. Cl.³ C08G 18/52; C09K 3/00
U.S. Cl. 528—79 8 Claims

1. Polytetramethylene ether glycol modified so that it contains in its chain 1–25%, by weight, of moieties represented by the structure



where R is hydrogen, an alkyl radical of 1–3 carbon atoms or phenyl, and the oxygen atom is linked to a hydrogen atom or a carbon atom;

the modified polytetramethylene ether glycol having an oxygen/sulfur atom ratio of 3/1 or greater.

7. A polyurethane which is the reaction product of

(a) the polytetramethylene ether glycol of claims 1, 2 or 3;

(b) an organic polyisocyanate; and

(c) a chain extender.

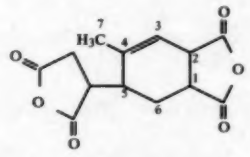
4,371,688

SUBSTITUTED CYCLOHEXANE-1,2-DICARBOXYLIC ANHYDRIDES AND EPOXY RESINS CONTAINING SAME

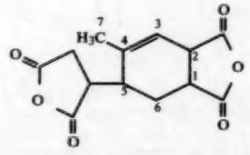
Patrick D. Moore, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 180,300, Aug. 22, 1980, abandoned. This application Nov. 19, 1981, Ser. No. 323,142
Int. Cl.³ C08G 59/42
U.S. Cl. 528—112 16 Claims

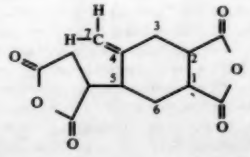
1. A substituted CHDA having the structural formula:



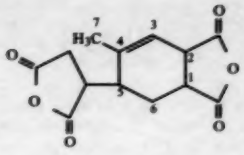
2. A substituted CHDA composition which comprises a predominant amount of a compound of the formula:



and a minor amount of a compound of the formula:



4. A curable epoxy resin composition comprising an epoxy resin and an epoxy resin curing agent, wherein the epoxy resin curing agent is represented by the formula:



4,371,689

CURABLE RESIN COMPOSITION COMPRISING CYANATE ESTER AND ACRYLIC ALKENYL ESTER

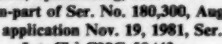
Morio Gaku, Showamachi, and Nobuyuki Ikeguchi, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,508
Claims priority, application Japan, Aug. 8, 1979, 54/100927
Int. Cl.³ C08G 83/00, 73/10
U.S. Cl. 528—162 10 Claims

1. A curable resin composition comprising:

(a) at least one cyanate ester compound selected from the group consisting of:

(1) a polyfunctional aromatic cyanate ester monomer having the formula:



wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a homoprepolymer of one or more cyanate ester monomers of (1), and

(3) a coprepolymer of (1) and an amine; and

(b) at least one compound selected from the group consisting of:

(1) an alkenyl acrylic ester,

(2) an alkenyl methacrylic ester,

(3) a homoprepolymer of one or more alkenyl acrylic esters of (1),

(4) a homoprepolymer of one or more alkenyl methacrylic esters of (2),

(5) a coprepolymer of (1) and (2); said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

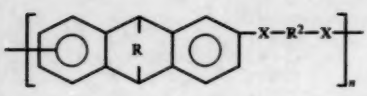
4,371,690

HEAT-RESISTANT RIGID POLYMERS FROM DIFUNCTIONAL 9,10-DIHYDRO-9,10-ETHANOANTHRACENES

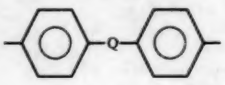
Burton C. Anderson, and August H. Frazer, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 57,113, Jul. 12, 1979, Pat. No. 4,281,106, This application Feb. 9, 1981, Ser. No. 232,566
Int. Cl.³ C08G 69/26, 63/12, 18/00
U.S. Cl. 528—190 16 Claims

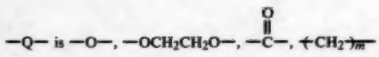
1. A tractable polymer containing repeating units of the structure



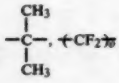
wherein —R— is $—CR'_2CHR'—$ and —R′ is —H or $—CH_3$; and $—R^2—$ is, independently, an alkylene group containing 2 to 14 carbon atoms, an arylene group containing 6 to 14 carbon atoms, an alkyl-substituted or chloro-substituted arylene group containing 6 to 14 carbon atoms, a cycloalkylene group containing 4 to 14 carbon atoms, or



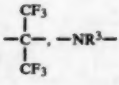
where



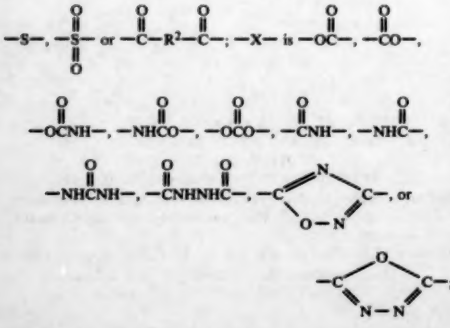
where m is 1 to 10,



where o is 1 to 8,



where R^3 is an alkyl group containing 1 to 6 carbon atoms or an aryl group containing 6 to 12 carbon atoms,



and n is at least 10.

4,371,691

PREPARATION OF POLYCARBONATE FROM SPECIFIC CRUDE BISPHENOLS

Gerhard Friedhofen; Volker Serini; Rainer Neumann; Dieter Freitag, and Hans-Helmut Schwarz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,269

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928464

Int. Cl.³ C08G 63/62

U.S. Cl. 528—196 6 Claims

1. In the process for the preparation of a thermoplastic, aromatic, high-molecular weight polycarbonate from at least one crude bisphenol, the improvement comprising:

(i) separating said at least one crude bisphenol, immediately after its preparation, from excess of at least one phenol and low boiling substance, in an evaporator at a temperature between 100° and 300° C., and under a pressure of between 0.05 and 1000 millibars, and

(ii) subjecting said crude bisphenol to desorption using an inert gas to attain a presence therein of monophenols of less than 2.5 percent by weight.

4,371,692

ELASTOMERIC POLYETHERESTERIMIDES

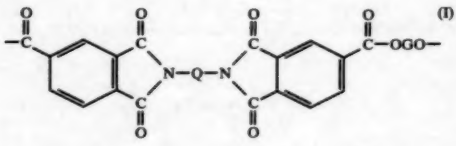
James R. Wolfe, Jr., Wilmington, DE, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1981, Ser. No. 308,130

Int. Cl.³ C08G 69/44, 73/16

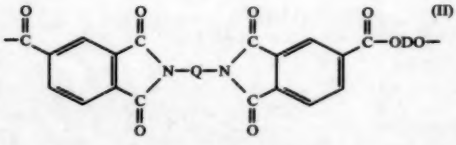
U.S. Cl. 528—289 7 Claims

1. A thermoplastic elastomeric polyetheresterimide comprising a multiplicity of long chain esterimide units being represented by the formula



(I)

and short chain esterimide units being represented by the formula



(II)

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide)glycol having a number average molecular weight of about 400–4000; D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 300 and Q is a divalent radical remaining after removal of amino groups from an aliphatic primary diamine having a molecular weight of less than 350; with the provisos that from about 0.5 to 5 of said short chain esterimide units are present for each of said long chain esterimide units and that said polyetheresterimide has a softening point of at least 160° C.

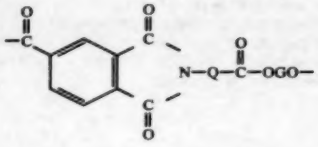
7. Process for the preparation of the polyetheresterimide of claims 1 or 2 by melt condensation of a mixture of trimellitic anhydride, a primary aliphatic diamine, a poly(alkylene oxide) glycol and a molar excess of a low molecular weight diol, said trimellitic anhydride and said diamine being present in a molar ratio of 2.0:0.85 to 2.0:1.15.

4,371,693
THERMOPLASTIC ELASTOMERIC POLYETHERESTERIMIDES

James R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

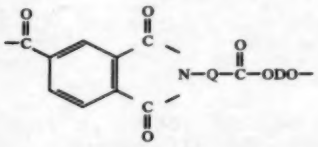
Filed Oct. 2, 1981, Ser. No. 308,131
Int. Cl.³ C08G 69/08, 69/44
U.S. Cl. 528—292 6 Claims

1. A thermoplastic elastomeric polyetheresterimide comprising a multiplicity of long chain esterimide units being represented by the formula



(I)

and short chain esterimide units being represented by the formula



(II)

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide)glycol having a number average molecular weight of about 400–4000; D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 300 and Q is a divalent radical remaining after removal of an amino group and a carboxyl group from an aliphatic primary amino acid having a molecular weight of less than 250; with the proviso that from about 2 to 10 of said short chain esterimide units are present for each of said long chain esterimide units.

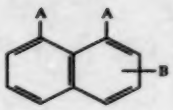
5. A polyetheresterimide of claim 1 wherein the divalent radical Q is derived from glycine, the divalent radical D is derived from ethylene glycol and the divalent radical G is derived from poly(tetramethylene oxide) glycol having a number molecular weight of 600–2200.

4,371,694
AROMATIC COMPOUNDS AND THEIR MANUFACTURE

Michael S. Alexiou, Uxbridge; Philip I. Brittain, Bray, and John H. P. Tyman, Uxbridge, all of England, assignors to Brent Chemicals International Limited, Iver, England

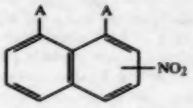
PCT No. PCT/GB79/00183, § 371 Date Jul. 1, 1980, § 102(e) Date Jul. 1, 1980, PCT Pub. No. WO80/00963, PCT Pub. Date May 15, 1980
PCT Filed Nov. 7, 1979, Ser. No. 197,772
Claims priority, application United Kingdom, Nov. 7, 1978, 43411/78
Int. Cl.³ C07D 221/14, 311/06; C07C 101/66
U.S. Cl. 546—100 11 Claims

1. A process for producing a compound of Formula I



I

from a compound of formula Ia



Ia

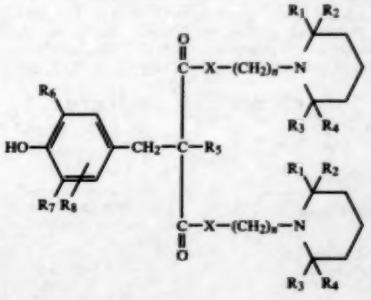
wherein, in each of Formula I and Formula Ia, each substituent A contains a carbonyl group substituted direct into the ring and the two substituents A may be linked to form a cyclic group with the carbon atoms to which they are attached and the groups B and NO_2 are each in the same position and are in a position selected from the 2 and 4 positions and, in Formula I, B is selected from secondary and tertiary amino groups, the process comprising reacting the compound of Formula Ia in a substantially anhydrous reaction medium containing a solvent with at least a stoichiometric amount of a reagent selected from organic primary and secondary amines.

4,371,695
STABILIZERS FOR POLYMERS AND POLYMERS STABILIZED THEREBY

Piero Di Battista, and Francesco Gratani, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 116,850, Jan. 30, 1980, Pat. No. 4,317,767.
This application Jun. 3, 1981, Ser. No. 269,847
Claims priority, application Italy, Feb. 1, 1979, 19761 A/79
Int. Cl.³ C07D 401/12
U.S. Cl. 546—190 2 Claims

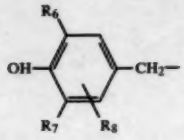
1. N-alkyl-piperidine derivatives of hydroxy-benzyl-malonic acid having the formula:



(I)

wherein each of

R_1, R_2, R_3 and R_4, which may be the same or different, is an alkyl radical having 1 to 6 carbon atoms or R_1 and R_2 together and R_3 and R_4 together form a cycloalkyl radical having 5 to 8 carbon atoms; R_5 is hydrogen, an alkyl radical having 1 to 18 carbon atoms or a 4-hydroxy-benzyl group of the formula:

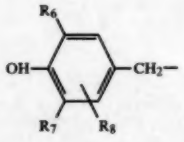


(II)

each of R_6 and R_7, which may be the same or different, is hydrogen, an alkyl radical having 1 to 6 carbon atoms, an aralkyl radical having 7 to 9 carbon atoms or a cyclo-alkyl radical having 5 to 8 carbon atoms; R_8 is hydrogen or an alkyl radical having 1 to 6 carbon atoms; n is an integer comprised between 1 and 12, and X is oxygen or

wherein R_9 is hydrogen, an alkyl radical having 1 to 18 carbon atoms, an alkenyl radical having 3 to 4 carbon atoms, a cyclo-alkyl radical having 4 to 12 carbon atoms, an aryl radical having 6 to 12 carbon atoms or an aralkyl radical having 7 to 9 carbon atoms.

2. N-alkyl-piperidine derivatives of hydroxy-benzyl-malonic acid according to claim 1, in which, in formula (I), each of R_1 R_2, R_3 and R_4 is methyl; R_5 is butyl or hydroxy-benzyl of general formula:



(II)

R_6 and R_7 are each tert.butyl, R_8 is hydrogen, X is oxygen and n is an integer from 2 to 6.

4,371,696

CERTAIN PYRIDINE METHYLTHIO ACETALDEHYDE DERIVATIVES AND NON-CYCLIC AND CYCLIC ACETALS THEREOF

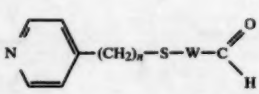
Joseph G. Lombardino, Niantic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 168,127, Jul. 14, 1980, abandoned, which is a division of Ser. No. 85,011, Oct. 15, 1979, Pat. No. 4,246,263. This application Jun. 26, 1981, Ser. No. 276,242

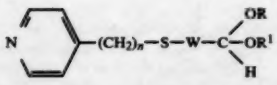
Int. Cl.³ C07D *407/12, 213/48, 213/51*

U.S. Cl. 546—283 **6 Claims**

1. A compound of the formula



or



wherein

n is 1 or 2;

W is methylene, unsubstituted or substituted with either methyl or phenyl;

R and R^1 when taken separately are the same and are each (C_1–C_4)alkyl; and

R and R^1 when taken together are ethano or propano;

or a pharmaceutically-acceptable acid addition salt thereof.

4,371,697

3-[1-(HYDROXYMETHYL)-2-PHENYLETHYL]-N-[(PHENYLAMINO)-CARBONYL]SYDNONE IMINE

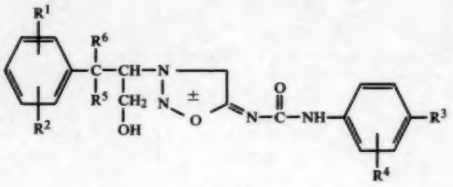
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,702

Int. Cl.³ C07D *271/04;* **A61K** *31/42*

U.S. Cl. 548—125 **7 Claims**

1. A compound of the formula:



in which

R^1 and R^2 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, perfluoroalkyl of 1 to 3 carbon atoms, nitro, alkanoyl of 2 to 4 carton atoms or alkoxycarbonyl of 2 to 4 carbon atoms;

R^3 is hydrogen, halo, nitro or alkanoyl of 2 to 4 carbon atoms;

R^4 is hydrogen, halo, nitro or perfluoroalkyl of 1 to 3 carbon atoms;

R^5 and R^6 are, independently, hydrogen, methyl or ethyl;

or a non-toxic acid addition salt thereof.

4,371,698

PROCESS FOR THE PURIFICATION OF MERCAPTOBENZOTHIAZOLE

Michel J. C. Alicot, La Barthe De Neste, and Adrien P. N. Tignol, Montrejeau, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Feb. 14, 1980, Ser. No. 121,570

Claims priority, application France, Mar. 6, 1979, 79 05710

Int. Cl.³ C07D *277/72*

U.S. Cl. 548—177 **7 Claims**

1. Process for the purification of mercaptobenzothiazole which comprises the steps of adding aniline to the crude product resulting from the reaction of aniline, sulfur and carbon disulfide in the reactor where the synthesis took place, at a temperature between 170° and 300° C., the amount of aniline being sufficient to solubilize the impurities in said crude product, cooling the resultant mixture to ambient temperature, filtering and washing with aniline the precipitated mercaptobenzothiazole which is thus obtained as a purified product.

6. Process for the purification of mercaptobenzothiazole which comprises the steps of releasing the crude product to atmospheric pressure in the reactor where the synthesis took place, removing the gaseous by-product from said crude product resulting from the reaction of aniline, sulfur and carbon dioxide, mixing the degassified product, at a temperature between 15° C. and 184° C., with aniline in sufficient amount to solubilize the impurities in said crude product, cooling the resultant mixture to ambient temperature, filtering and washing with aniline the precipitated mercaptobenzothiazole which is thus obtained as a purified product.

4,371,699

PROCESS FOR PREPARATION OF OPTICALLY ACTIVE N-MERCAPTOALKANOYLAMINO ACIDS

Takehisa Ohashi, Kobe; Masami Shimazaki, Takasago; Kazunori Kan, Kobe; Hideo Kondo, Takasago, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

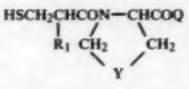
Filed Dec. 9, 1980, Ser. No. 214,780

Claims priority, application Japan, Dec. 13, 1979, 54-162377; Dec. 13, 1979, 54-162378; Dec. 28, 1979, 54-171904; Mar. 8, 1980, 55-29430

Int. Cl.³ C07D *207/16, 211/60, 277/06*

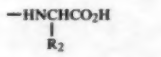
U.S. Cl. 548—201 **17 Claims**

1. A process for the preparation of an optically active N-mercaptoalkanoylamino acid represented by formula (I):



(I)

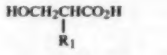
wherein R_1 is lower alkyl having from 1 to 4 carbon atoms, Y is $(CH_2)_n$, n being 1 or 2, or sulfur, and Q is hydroxy or the residual part of an amino acid represented
by formula (II):



(II)

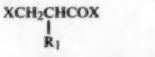
wherein R_2 is lower alkyl having from 1 to 4 carbon atoms or benzyl, which comprises

(1) reacting an optically active β-hydroxyalkanoic acid represented by formula (III):



(III)

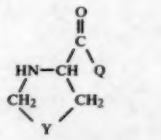
wherein R_1 is the same as defined above, with thionyl chloride or thionyl bromide in the presence of a catalyst by keeping the temperature of the reaction mixture at not more than 25° C. when said thionyl chloride or thionyl bromide is mixed with the compound (III) and then raising the temperature of the reaction mixture up to from about 30° C. to about 100° C. to prepare an optically active β-haloalkanoyl halide represented by formula (IV):



(IV)

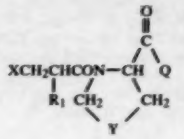
wherein X is chlorine or bromine and R_1 is the same as defined above;

(2) reacting the β-haloalkanoyl halide with an amino acid represented by formula (V):



(V)

wherein Y and Q are the same as defined above, to produce an optically active N-β-haloalkanoylamino acid represented by formula (VI):



(VI)

wherein X, R_1, Y and Q are the same as defined above; and

(3) reacting the N-β-haloalkanoylamino acid with an alkali metal salt of hydrogen sulfide or ammonium hydrosulfide, of which the molar ratio to the compound (VI) is from about 2 to about 10, in water or a polar aprotic solvent at a temperature of from about 60° C. to about 90° C., the configuration of the formulas (II), (III), (IV), (V), and (VI) being retained in all the optically active compounds throughout the process to prepare the compound represented by formula (I).

4,371,700

PREPARATION OF 1-AZOLYL-3,3-DIMETHYL-1-PHENOXY-BUTAN-2-OLS

Eckart Kranz, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

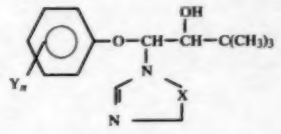
Filed Feb. 9, 1981, Ser. No. 232,461

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007079

Int. Cl.³ C07D *249/08, 233/60*

U.S. Cl. 548—262 **5 Claims**

1. A process for the preparation of a 1-azolyl-3,3-dimethyl-1-phenoxy-butan-2-ol of the formula



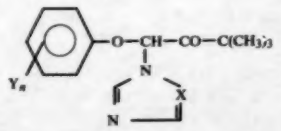
in which

X is a nitrogen atom or a CH group,

Y each independently is halogen, phenyl, phenoxy, nitro, alkyl, alkoxy or cycloalkyl, and

n is 0, 1, 2 or 3,

comprising reacting a 1-azolyl-3,3-dimethyl-1-phenoxybutan-2-one of the formula



with formic acid/triethylamine in the form of a 5:2 addition compound of the formula

$$5HCOOH \times 2N(C_2H_5)_3,$$

about 1 to 4 mols of the addition compound being employed per mol of 1-azolyl-3,3-dimethyl-1-phenoxy-butan-2-one.

4,371,701

ADDUCTS OF 1-CYCLOHEXENE-1,2-DICARBOXYLIC ANHYDRIDE WITH OLEFINS

Ellis K. Fields, River Forest, and Tayseer S. Nimry, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 14, 1981, Ser. No. 330,154

Int. Cl.³ C07D *307/89*

U.S. Cl. 549—235 **7 Claims**

1. A bicyclo [4.2.0] octane-1,6-dicarboxylic acid compound which comprises the adduct of 1-cyclohexene-1,2-decarboxylic acid anhydride and an olefinically unsaturated compound selected from the group consisting of an aliphatic olefin, a cycloaliphatic olefin and allyl ethers.

4,371,702

VAPOR PHASE OXIDATION OF N-BUTANE TO MALEIC ANHYDRIDE

Tom A. Bither, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1982, Ser. No. 349,305

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—260 **11 Claims**

1. Improved catalytic process for the oxidation of n-butane to maleic anhydride using a vanadium/phosphorus oxide catalyst, the improvement consisting of using a vanadium/phosphorus oxide catalyst containing the promoter comprising silicon and at least one of indium, antimony and tantalum, the Si/V atom ratio being in the range 0.02–3.0:1.0, the (In+Sb+Ta)/V atom ratio being in the range 0.005–0.2:1.0, and the P/V atom ratio being in the range 0.9–1.3:1.0, said catalyst being prepared in an aqueous or organic liquid medium by the procedure wherein the appropriate vanadium species substantially of valence +4 is first contacted with the promoter or promoter precursors and thereafter with the appropriate phosphorus species.

4,371,703

PROCESS FOR THE PRODUCTION OF ISOSORBIDE-5-NITRATE

Peter Stoss, Illertissen, Fed. Rep. of Germany, assignor to Heinrich Mack Nachf. Chem-Parm. Fabrik, Illertissen, Fed. Rep. of Germany

Filed Jan. 7, 1982, Ser. No. 337,903

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102947

Int. Cl.³ C07D *493/04*

U.S. Cl. 549—464 **4 Claims**

1. A process for the preparation of isosorbide-5-nitrate comprising

(a) heating an acylation mixture of isosorbide, said mixture containing varying proportions of isosorbide, isosorbide-2-acylate, isosorbide-5-acylate and/or isosorbide-2,5-diacylate, or pure isosorbide-5-acylate or an equimolar mixture of isosorbide-2,5-diacylate and isosorbide, in the presence of a transacylation catalyst and separating isosorbide-2-acylate from said mixture by fractional distillation;

(b) esterifying said isosorbide-2-acylate with nitric acid to form isosorbide-2-acylate-5-nitrate; and

(c) Partially hydrolysing said isosorbide-2-acylate-5-nitrate to form isosorbide-5-nitrate.

4,371,704

SUBSTITUTED ALKYLENE OXIDES FROM SUBSTITUTED ALKYLENE CARBONATES

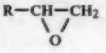
Edward E. McEntire, and Robert M. Gipson, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 920,908, Jun. 29, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,319

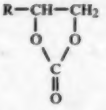
Int. Cl.³ C07D *317/36*

U.S. Cl. 549—518 **6 Claims**

1. A process for the preparation of a substituted ethylene epoxide of the formula



wherein R is alkyl, aryl, substituted alkyl or substituted aryl which comprises heating the corresponding substituted ethylene carbonate having the formula



wherein R is defined as above in the presence of a catalytic amount of a catalyst which is selected from the group of alkali metal fluorides consisting of lithium fluoride, sodium fluoride, and potassium fluoride.

4,371,705

SYNTHESIS OF ALPHA-AMINO ACIDS

Jefferson W. Davis, Jr., San Francisco, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 77,811, Sep. 21, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,104

Int. Cl.³ C07C *99/10*

U.S. Cl. 562—444 **6 Claims**

1. An improved process for synthesizing an alpha-amino acid comprising:

reacting a metal cyanide with an aldehyde or a ketone in the absence of water to form a corresponding cyanohydrin of the formula:

$$R_1R_2C(OH)CN$$

wherein R_1 and R_2 represent hydrogen, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 2 to 4 carbon atoms, aryl radicals of 6 to 12 carbon atoms, alkaryl radicals of 7 to 8 carbon atoms, aralkyl radicals of 7 to 8 carbon atoms, and p-hydroxyphenyl radicals,

reacting said cyanohydrin with thionyl chloride to form a chloronitrile of the formula:

$$R_1R_2C(Cl)CN$$

reacting said chloronitrile with ammonia to form an amino nitrile of the formula:

$$R_1R_2C(NH_2)CH; \text{ and,}$$

hydrolyzing said amino nitrile to the alpha-amino acid.

4,371,706

PREPARATION OF ALKALI METAL AMINOALKANOATES

James T. Edmonds, Jr., and Lacey E. Scoggins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 147,407, May 6, 1980, Pat. No. 4,324,886. This application Oct. 22, 1981, Ser. No. 315,072

Int. Cl.³ C07C 99/06

U.S. Cl. 562—553 4 Claims

1. A method for preparing alkali metal aminoalkanoate represented by the formula $RNH(CR_2)_nCO_2M$ where each R is selected from among hydrogen, and hydrocarbyl radicals selected from alkyl, cycloalkyl, aryl, and combinations in which the number of carbon atoms in each of the radicals ranges from 1 to about 12, M is an alkali metal selected from sodium, potassium, rubidium, and cesium, n is an integer of 1 to about 12, and the total number of carbon atoms in each molecule of the alkali metal aminoalkanoate is 3 to about 24, by contacting in the presence of an alkali metal carboxylate represented by the formula $R_3CO_2M_1$ where R_3 is a hydrocarbyl radical selected from among alkyl, cycloalkyl, aryl, and combinations thereof, said radicals having from 1 to about 20 carbon atoms, and M_1 is an alkali metal selected from lithium, sodium, potassium, rubidium, and cesium, a reaction mixture comprising:

(a) at least one alkali metal hydroxide;

(b) water, and

(c) at least one lactam.

4,371,707

PROCESS FOR THE CONVERSION OF BORON TRIFLUORIDE DIMETHYL ETHER COMPLEX TO THE BORON TRIFLUORIDE DIALKYL ETHER COMPLEX

Richard E. Eibeck, Orchard Park; Martin A. Robinson, East Amherst; Francis E. Evans, and Eugene B. Recla, both of Hamburg, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 15, 1980, Ser. No. 216,045

Int. Cl.³ C07F 5/02

U.S. Cl. 568—6 11 Claims

1. A process for the conversion of boron trifluoride-dimethyl ether complex into boron trifluoride-dialkyl ether complex substantially free of dimethyl ether impurities, which comprises:

(a) contacting the boron trifluoride diemthyl ether complex essentially free of boron trifluoride, in the liquid phase, with an effective amount of dialkyl ether wherein at least one alkyl group contains at least two carbon atoms in a reaction zone to form a liquid reaction mixture comprising boron trifluoride dialkyl ether complex and residual dimethyl ether and excess diethyl ether;

(b) restricting vapor equilibrium region above the liquid reaction mixture in the reaction zone, while heating the liquid reaction mixture for a time and at a temperature sufficient to remove the residual dimethyl ether and to form boron trifluoride dialkyl ether complex substantially free of dimethyl ether impurities; and

(c) recovering boron trifluoride dialkyl ether complex substantially free of dimethyl ether impurities.

4,371,708

4-SUBSTITUTED 3,3-DIMETHYL-BUTAN-2-ONES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS INTERMEDIATE PRODUCTS

Wolfgang Krämer, and Hans-Ludwig Elbe, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

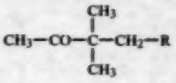
Filed May 20, 1981, Ser. No. 265,269

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021516

Int. Cl.³ C07C 151/00

U.S. Cl. 568—31 7 Claims

1. A 4-substituted 3,3-dimethyl-butan-2-one of the formula



in which

R represents cyano or the grouping —X—R^1,

wherein

R^1 represents n-alkyl with 1 to 4 carbon atoms, isopropyl, isobutyl, sec.-butyl, alkenyl with 3 to 4 carbon atoms, alkynyl with 3 to 4 carbon atoms, optionally substituted aryl or substituted aralkyl, or represents cyano provided that X represents —O— or —S—, and

X represents —O—, —S—, —SO—, or —SO_2—.

4,371,709

METHOD OF PREPARING OLIGOMERIC BROMINOUS XYLYLENE BISPHENOL ETHERS

Klaus-Dieter Steffen, Hennef, and Manfred Thallmeier, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

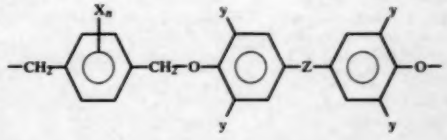
Filed Jul. 11, 1980, Ser. No. 167,555

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929914

Int. Cl.³ C07C 148/00, 41/16

U.S. Cl. 568—33 15 Claims

1. In a method of preparing an oligomeric-bromine-containing xylylene phenol ether, containing structural units of the formula



wherein

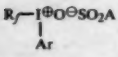
X-Br, Cl or H, n=1 to 4 and y is Br, Cl or H, independently of one another, at least two bromines being contained in the sum X+Y, and Z representing a direct bond, an alkylene moiety of 1–6 carbon atoms in the chain, or a —SO_2— group by contacting a p-xylylene dichloride and/or dibromide with a phenol, bisphenol or bis (hydroxyphenyl) sulphone in the presence of an alkaline compound in the form of an alkali metal salt at 85° to 160° C., the improvement wherein the process is carried out in the presence of a ketone solvent, said ketone being an aliphatic or cyclic ketone of 3 to 10 carbon atoms.

4,371,710
PERFLUOROALKYL COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Teruo Umemoto, Sagamihara, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

Continuation of Ser. No. 156,951, Jun. 6, 1980, Pat. No. 4,324,741. This application Sep. 17, 1981, Ser. No. 303,322
Claims priority, application Japan, Jun. 6, 1979, 54-69979
Int. Cl.³ C07C *143/00*; A61K *31/185*
U.S. Cl. 568—35 **1 Claim**

1. Perfluoroalkyl compounds represented by the formula (I):



(I)

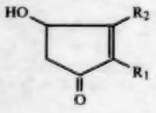
wherein R_f represents a perfluoroalkyl group having 1 to 20 carbon atoms, Ar represents a substituted or unsubstituted phenyl group wherein the substituent is an alkyl group having 1 to 4 carbon atoms or a halogen atom, I represents an iodine atom, and A represents a hydroxy group or a halogen atom.

4,371,711
PROCESS FOR PRODUCING 4-HYDROXYCYCLOPENTENONES

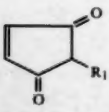
Kenji Saito, Toyonaka, and Hiroshi Yamachika, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 20, 1980, Ser. No. 151,603
Claims priority, application Japan, May 30, 1979, 54-67689; May 30, 1979, 54-67690; May 30, 1979, 54-67691; May 31, 1979, 54-68495
Int. Cl.³ C07C *45/29, 45/45, 45/59, 45/67*
U.S. Cl. 568—310 **3 Claims**

1. A method of producing a 4-hydroxycyclopentenone represented by the formula



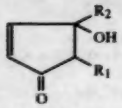
wherein R_1 is an alkyl, alkenyl, alkynyl, cycloalkyl, thienyl, phenyl, p-methylbenzyl or benzyl group and R_2 is an alkyl, alkenyl or alkynyl group having 6 or less carbon atoms, which comprises reacting a cyclopentendione compound of the formula,



wherein R_1 is as defined above, with a Grignard reagent of the formula,

R_2MgX

wherein R_2 is as defined above and X is chlorine, bromine or iodine, to obtain an oxocyclopentene compound of the formula



wherein R_1 and R_2 are as defined above; and reacting the oxocyclopentene compound in the presence of a base selected from the group consisting of hydroxides, carbonates, bicarbonates and acetates of sodium and potassium; basic salts of hydroxides, carbonates, bicarbonates and acetates of calcium and barium; triethylamine or pyridine; and basic ion exchange resins; in an amount of from 0.01 to 10 moles per mole of the oxocyclopentene compound at 0° to 200° C., or in the presence of alumina in an amount of from 0.5 to 30 times the weight of the oxocyclopentene compound at 0° to 150° C.

4,371,712
ALKYLSALICYLALDEHYDE PREPARATION

Richard J. Lee, Downers Grove, and Leonard J. Baranowski, Winfield, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 22, 1981, Ser. No. 313,798
Int. Cl.³ C07C *45/00*
U.S. Cl. 568—430 **13 Claims**

1. A method of preparing an alkylsalicylaldehyde whose alkyl-substituent contains at least 6 carbon atoms which method comprises reacting an alkylphenol whose alkyl-substituent contains at least 6 carbon atoms with a dialkoxymethane in the presence of a peroxide and in the presence of a free radical forming ionic manganese catalyst at a temperature of about the peroxides decomposition.

4,371,713
PROCESS FOR THE PREPARATION OF POLYETHER GLYCOL

Shuichi Matsumoto; Kenji Yasuda; Masayuki Endoh, all of Yokohama, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,287
Claims priority, application Japan, Nov. 4, 1980, 55-153781; Nov. 6, 1980, 55-155184; May 29, 1981, 56-80997
Int. Cl.³ C07C *41/02*
U.S. Cl. 568—614 **14 Claims**

1. A process for preparing polyether glycol, comprising (A) polymerizing tetrahydrofuran or a mixture of tetrahydrofuran and other copolymerizable cyclic ether(s) in the presence of a ring-opening polymerization catalyst comprising as principal components fuming sulfuric acid and/or fluorosulfuric acid, (B) adding water or an aqueous alkali solution to the polymerization product, hydrolyzing the said product under the strongly acidic condition, and (C) washing the hydrolysis product, characterized in that the polymerization of tetrahydrofuran or a mixture of tetrahydrofuran and other copolymerizable cyclic ether(s) is conducted by (1) contacting the monomer with the ring-opening polymerization catalyst at a temperature within the range of −30° C. to 10° C. at the first stage and (2) elevating the reaction temperature, when the conversion of said monomer into the polymer has reached 5% or more, to a temperature which falls within the range of 0° C. to 40° C. and is at least 10° C. higher than the reaction temperature at the first stage and continuing the polymerization reaction at the elevated temperature.

4,371,714

PREPARATION OF 4-ALKYLANISOLES AND PHENOLS

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,237
Int. Cl.³ C07C 41/30
U.S. Cl. 568—628 15 Claims

1. A process for the selective production of 4-alkylanisole comprising:

contacting an alkylating agent with anisole, in the presence of a crystalline zeolite having a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12, at a temperature of 100° C. to 600° C. and a pressure of between 10^4 Pa and 10^7 Pa, whereby said alkylating agent is reacted with said anisole to yield a product enriched in 4-alkylanisole.

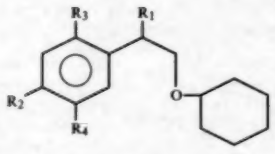
4,371,715

PROCESS FOR PREPARING CYCLOHEXYL PHENETHYLETHER DERIVATIVES

Jacob Kiwala, Brooklyn, N.Y.; Richard J. Tokarzewski, Keyport, N.J.; Frederick L. Schmitt, Holmdel, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

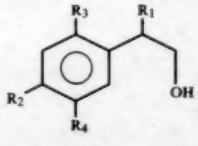
Division of Ser. No. 235,844, Feb. 19, 1981, Pat. No. 4,324,923, which is a continuation-in-part of Ser. No. 192,238, Sep. 30, 1980, Pat. No. 4,306,096. This application Sep. 25, 1981, Ser. No. 305,535
Int. Cl.³ C07C 41/06
U.S. Cl. 568—659 5 Claims

1. A process for preparing a cyclohexyl phenethylether derivative defined according to the structure:



wherein R_1, R_2, R_3 and R_4 are the same or different and each represents methyl or hydrogen comprising the steps of intimately admixing cyclohexene having the structure:

with a phenylethyl alcohol derivative having the structure:



in the presence of an Amberlyst ® 15 sulfonated copolymer of styrene and divinyl benzene catalyst, wherein the temperature of reaction is 110° C.; wherein the pressure of reaction is 1 atmosphere; wherein the mole ratio of phenylethyl alcohol derivative:cyclohexene is 1:1; and wherein the weight ratio of catalyst:phenylethyl alcohol derivative is from about 2:100 up to about 20:100; the reaction being carried out by addition of the cyclohexene to the phenylethyl alcohol derivative during which addition, residual water is removed by azeotropic distillation; neutralizing the resulting reaction mass with base; and fractionally distilling the cyclohexyl phenethylether derivative from the reaction mass.

4,371,716

β-(SEC-ALKOXY) ETHANOL PROCESS

Timm E. Paxson; Leo Kim, both of Houston, Tex., and Andre B. Van Aken, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 71,895, Sep. 4, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,267
Int. Cl.³ C07C 41/06
U.S. Cl. 568—678 2 Claims

1. A process for preparing β-(sec-alkoxy) ethanol which comprises (a) reacting an olefin having from about 8 to about 22 carbon atoms with ethylene glycol at a temperature ranging from about 80° to about 180° in the presence of an acid catalyst selected from the group consisting of sulfuric acid and benzenesulfonic acid and sufficient solvent to provide a one phase reaction medium with the solvent consisting essentially of a substance selected from the group consisting of, 2,4-dimethylsulfolane, 3,4-dimethylsulfolane, and mixtures thereof, (b) extracting the reaction product with an alkane having a carbon number ranging from about 5 to about 20 and (c) recovering the β-(sec-alkoxy) ethanol product from the alkane product.

4,371,717

PROCESS FOR THE IN-SOLVENT, IN-SITU GENERATION OF HALOALKYL ALKYL ETHERS

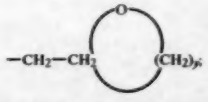
Gerhard H. Alt, University City, and John P. Chupp, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 133,720, Mar. 25, 1980, Pat. No. 4,284,564. This application Feb. 3, 1981, Ser. No. 230,996
Int. Cl.³ C07C 41/01
U.S. Cl. 568—681 9 Claims

1. A process for preparing haloalkyl ethers having the formula

(I)

where R_1 is alkyl containing 1 to 4 carbon atoms; X is chloro, bromo or iodo; R is alkyl containing 1 to 10 carbon atoms, alkenyl containing 3 to 10 carbon atoms, cycloalkyl containing 3 to 10 carbon atoms, alkynyl containing 3 to 10 carbon atoms, (C_{1-5}) alkoxy (C_{2-5}) alkyl, mono-halo (C_{2-5}) alkyl, mono-halo (C_{3-5}) alkenyl or



y is the integer 2, 3, or 4, with the proviso that when R is alkenyl or alkynyl the carbon atom attached to the oxygen may not share a double or triple bond with an adjacent carbon atom;

which comprises reacting an alcohol of the formula

ROH (II)

(where R is as defined in Formula I);

with an aldehyde of formula

(III)

(where R_1 is as defined in Formula I);

in the presence of a solvent and in the presence of a halide liberating ion compound of the formula

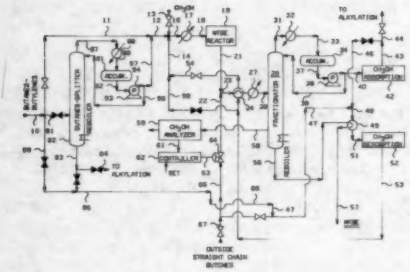
where X is as defined in Formula I and where R_5 is C_{1-5} alkyl, phenyl or benzyl; the temperature of said reaction being from about −20° C. to 100° C.

4,371,718

USING BUTENES TO FRACTIONATE METHANOL FROM METHYL-TERTIARY-BUTYL ETHER

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 2, 1981, Ser. No. 279,916
Int. Cl.³ B01D 3/36; C07C 41/42
U.S. Cl. 568—697 **7 Claims**



1. A process for the production of a substantially pure MTBE stream which comprises:

(a) feeding methanol and isobutene to an MTBE reactor means,

(b) reacting in said MTBE reactor means methanol with isobutene under reaction conditions under liquid phase conditions employing an ion exchange resin catalyst, thereby producing a reaction stream comprising unreacted methanol, unreacted isobutene, and MTBE,

(c) feeding added n-butenes to a fractionation means,

(d) feeding said reaction stream to said fractionation means,

(e) fractionating in fractionating means said reaction stream with said added n-butenes, and taking an overhead vapor stream comprising unreacted isobutene and an azeotrope of said n-butenes with said unreacted methanol, wherein said n-butenes are present in an amount effective to take unreacted methanol overhead as an azeotrope, thereby producing substantially pure MTBE as liquid bottoms,

(f) withdrawing a sample stream from said fractionation means said sample stream taken from said fractionation means below the input of said reaction stream and above the outlet of said bottoms stream,

(g) monitoring the methanol content of said sample stream and generating a signal in response to the methanol content thereof,

(h) controlling the addition of said added n-butenes in said step (c) to said fractionation means in response to said signal, whereby said signal controls the increase or decrease of addition of said added n-butenes, thereby maintaining an effective level of said n-butenes in said fractionation means to maintain substantially methanol-free bottoms.

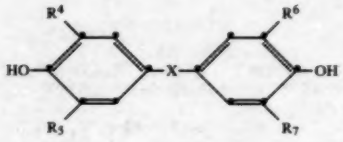
4,371,719

CURABLE MIXTURES BASED ON MALEIMIDES AND PROPENYL-SUBSTITUTED PHENOLS, AND THE USE THEREOF

Abdul-Cader Zahir, Oberwil, and Siegfried Wyler, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

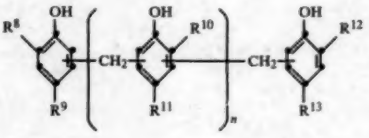
Division of Ser. No. 104,593, Dec. 17, 1979, Pat. No. 4,288,583. This application Feb. 23, 1981, Ser. No. 237,237
Claims priority, application Switzerland, Dec. 29, 1978, 13279/78
Int. Cl.³ C07C 39/16
U.S. Cl. 568—723 **2 Claims**

1. A polyvalent phenol of the formula III



(III)

where R^4, R^5, R^6 and R^7 are each a hydrogen atom, or an allyl or propenyl group, with at least one of the substituents R^4 to R^7 being the propenyl group, and X is isopropylidene or methylene or of the formula IV



(IV)

wherein R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13} are each a hydrogen atom, alkyl having 1 to 4 C atoms, allyl or propenyl, with at least one of the substituents R^8 to R^{13} being the propenyl group, and n denotes a value from 0 to 10 inclusive, which contains in the molecule at least one 1-propenyl group in the ortho- or para-position with respect to the hydroxyl group, or an isomeric mixture of said polyvalent phenols which are propenyl-substituted in the ortho- or para-position and polyvalent phenols which are allyl-substituted in the ortho- or para-position, the proportion of propenyl groups in the isomeric mixture having to be at least 5 equivalent-%, relative to the sum of the equivalents of propenyl and allyl groups.

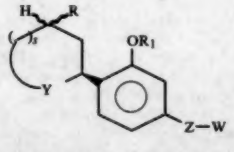
4,371,720

2-HYDROXY-4-(SUBSTITUTED) PHENYL CYCLOALKANES AND DERIVATIVES

Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 188,795, Sep. 19, 1980, abandoned. This application Jul. 28, 1981, Ser. No. 286,661
Int. Cl.³ C07C 39/11
U.S. Cl. 568—731 **10 Claims**

1. A compound having the formula



wherein

R is hydroxy, mandeloyloxy or alkanoyloxy having from one to five carbon atoms; carbon atoms;
s is an integer of 1 or 2;
Y is $—CH(R_2'')CH(R_2)—$ or $—CH(R_3)CH_2—$;
R_2'' is hydrogen or methyl;
R_2 is X-substituted alkyl having from one to six carbon atoms;
R_3 is X-substituted alkyl having from one to three carbon atoms;
X is $—OR_6$;
R_6 is hydrogen, alkyl having from one to six carbon atoms or acetyl;
W is hydrogen; and Z is
(a) alkylene having from five to thirteen carbon atoms; or
(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to thirteen carbon atoms; each of m and n is 0 or 1; with the provisos that the summation of carbon atoms in (alk_1) plus (alk_2) is not less than five or greater than thirteen.

4,371,721

SELECTIVE CRACKING OF DISUBSTITUTED BENZENES HAVING POLAR SUBSTITUENTS

Margaret May-Som Wu, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 969,745, Dec. 14, 1978, abandoned. This application Sep. 25, 1981, Ser. No. 305,570

Int. Cl.³ C07C *37/86, 17/38, 45/85, 85/26*

U.S. Cl. 568—750 **20 Claims**

1. A process for selective cracking of a 1,4-disubstituted benzene compound having a polar first substituent selected from hydroxy, formyl, halo and amino and a second substituent selected from halo and alkyl, in an isomeric mixture containing one or more additional isomers of said disubstituted benzene compound, said process comprising contacting said mixture with a crystalline zeolite catalyst at a temperature of between about 300° C. and about 450° C. and a pressure between about 10^4 N/m^2 and about 10^6 N/m^2, said catalyst being characterized by a silica to alumina ratio of at least 12 and a constraint index within the approximate range of 1 to 12.

20. A process according to claim **1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17** or **18** wherein said disubstituted benzene compound has an alkyl non-polar substituent thereon and a hydroxy polar substituent thereon.

4,371,722

CYCLIC TERPENOID AMINES, THEIR PREPARATION AND USES

Bernard J. Kane, Atlantic Beach, and Richard A. Von Genk, Jacksonville, both of Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 130,374, Mar. 14, 1980, Pat. No. 4,307,255, which is a division of Ser. No. 860,284, Dec. 14, 1977, Pat. No. 4,244,890. This application Jun. 26, 1981, Ser. No. 277,815

Int. Cl.³ C07C *35/08*

U.S. Cl. 568—828 **8 Claims**

1. A process for making 1,3,3-trimethyl-2-methylene-cyclohexan-1-ol which comprises maintaining an acidic aqueous solution of an acyclic terpenoid group-containing amine represented by

$$T_ANR_1R_2$$

where T_A is a neryl group or a geranyl group, R_1 is a C_1–C_4 aliphatic group, R_2 is a monovalent organic group, or R_1 and R_2 are joined together and with N as a cyclic group, at a temperature of at least about 80° C., until said acyclic terpenoid group cyclizes, there being at least about 1.1 equivalents of acid per equivalent of said amine in said solution; recovering a mixture of alpha-, beta-, and gamma-cyclogeranylamines, reacting said mixture of amines with a carboxylic acid anhydride at about 70° C. to 250° C. to selectively form a beta-cyclogeranyl ester of a carboxylic acid and, as a by-product formed during said reaction, the cyclolinalyl ester of a carboxylic acid, recovering separately said beta-cyclogeranyl ester of a carboxylic acid, unreacted alpha-, and gamma-cyclogeranyl amines, and the cyclolinalyl ester of said carboxylic acid, and hydrolyzing the recovered cyclolinalyl ester by heating in the presence of an aqueous solution of an acid or a base to form 1,3,3-trimethyl-2-methylene-cyclohexan-1-ol.

4,371,723

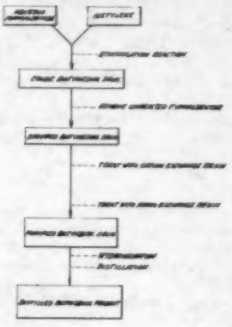
PROCESS OF PRODUCING A DISTILLED BUTANEDIOL PRODUCT OF HIGH QUALITY IN HIGH YIELD

Max E. Chiddix, League City, Tex., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 140,926, Apr. 16, 1980, abandoned, which is a continuation of Ser. No. 812,615, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 675,686, Apr. 9, 1976, abandoned. This application Aug. 6, 1981, Ser. No. 290,548

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—861 **15 Claims**



1. In the process of producing distilled butanediol product from an aqueous butynediol solution which contains metallic and formate ions, which process comprises hydrogenating said butynediol to butanediol and distilling said butanediol, the improvement which is characterized by:

treating said butynediol solution prior to said hydrogenation treatment with a cationic exchange resin to remove said metallic ion, and an anionic resin to remove formate ion, then hydrogenating and distilling the butanediol at about 160°-200° C. to obtain a distilled butanediol product having a purity of at least 99.7%, in a yield of at least 93%, and a residue which is fluid and pumpable at the distillation temperature for recycling or disposal thereof.

4,371,724

ETHANOL SYNTHESIS BY HOMOLOGATION OF METHANOL

Jiang-Jen Lin, and John F. Knifton, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 8, 1981, Ser. No. 224,199

Int. Cl.³ C07C *27/00*

U.S. Cl. 568—902 **23 Claims**

1. A process for preparing ethanol which comprises contacting a mixture of carbon monoxide, hydrogen and methanol with a catalyst system comprising a ruthenium compound, a quaternary phosphonium or ammonium base or salt and a cobalt compound selected from the group consisting of cobalt(II) iodide, cobalt(II) bromide and cobalt(II) chloride, in the presence of an inert liquid oxygenated hydrocarbon solvent and at a pressure of 500 psi or greater and at a temperature of at least 150° C.

4,371,725

PROCESS FOR THE PREPARATION OF TERTIARY OLEFINS AND N-ALKANOLS

Jens Herwig, Cologne; Bernhard Schleppinghoff, and Hans-Volker Scheef, both of Dormagen, all of Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,646

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048084

Int. Cl.³ C07C 29/00, 1/20

U.S. Cl. 568—907 12 Claims

1. A process for preparing a tertiary olefin from the corresponding n-alkyl ether thereof which comprises contacting said n-alkyl ether with hydrogen in the presence of an acidic molecular sieve at a temperature from 100° to 300° C. and simultaneously removing the n-alkanol which forms.

4,371,726

COMPOSITION SUITABLE FOR MECHANICAL POWER TRANSMISSION AND PROCESS FOR OPERATING TRACTION DRIVES

Yoshiharu Horita, Tokyo; Kenichi Fujimoto, Kanda; Michio Hoshino, Yokohama; Tetsuo Takito, Kawasaki, and Masayoshi Muraki, Yokohama, all of Japan, assignors to Nippon Steel Chemical Co., Ltd. and Mitsubishi Oil Co., Ltd., both of Tokyo, Japan

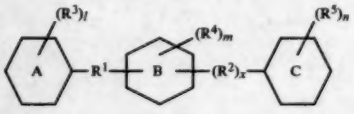
Filed Jul. 16, 1981, Ser. No. 283,967

Claims priority, application Japan, Feb. 13, 1981, 56/18990; Feb. 13, 1981, 56/18991

Int. Cl.³ C10M 1/16, 1/20

U.S. Cl. 585—3 21 Claims

1. A composition, suitable for use in mechanical power transmission units, consisting essentially of a minor amount of an antioxident in admixture with a hydrocarbon oil which has from 19 through 30 carbon atoms and three six-membered carbocyclic rings and consists of a mixture of compounds having the following formula:



(I)

wherein R^1 is a divalent straight or branched chain radical C_yH_{2y} where y is an integer of 1 through 3; R^2 is a straight chain radical C_zH_{2z} where z is an integer of 1 through 3; R^3, R^4, and R^5 are the same or different alkyl groups having from 1 through 4 carbon atoms; l, m, and n each is an integer from zero through 3; and x is zero or 1; and wherein rings A and B are hydrogenated benzene rings and ring C is a hydrogenated benzene ring when x is 1 and a hydrogenated benzene ring or a cyclohexane ring when x is zero said hydrogenated benzene rings being saturated with hydrogen to the extent of at least 80% but less than 100% of the theoretical and said hydrocarbon oil being otherwise unsaturated.

4,371,727

FUEL OILS FROM COAL

Derek G. Gavin, Longhope, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 7, 1980, Ser. No. 194,798

Claims priority, application United Kingdom, Oct. 19, 1979, 7936411

Int. Cl.³ C10L 1/08

U.S. Cl. 585—14 5 Claims

1. A process for the production of Diesel fuel suitable for high speed engines, comprising hydrogenating over a hydrogenation catalyst at a temperature of 350° to 450° C. and a hydrogen pressure of 50 to 750 bars a fraction of a hydrocracked coal extract boiling in the range of 170° to 350° C., which fraction contains at least 90% of polycyclic hydrocarbons, contains a major proportion of naphthenes and does not contain any significant amount of mineral matter or paraffinic material, and fractionating the product hydrogenated oil using cut points within the range of 170° to 350° C. to yield a gas oil.

4,371,728

SELECTIVE REMOVAL OF OLEFINS OVER ZINC TITANATE PROMOTED WITH SELECTED METALS

Floyd E. Farha, Jr., and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 190,004, Sep. 23, 1980, Pat. No. 4,313,820, which is a continuation-in-part of Ser. No. 125,438, Feb. 28, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,776

Int. Cl.³ C07C 7/163

U.S. Cl. 585—258 15 Claims

1. A process for hydrogenating olefin contaminants contained in a fluid stream comprising the step of contacting said fluid stream under suitable hydrogenation conditions with a catalyst composition comprising zinc titanate and at least one promoter selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel, molybdenum, rhenium, and compounds thereof, wherein the concentration by weight of said at least one promoter in said catalyst composition is less than the total concentration by weight of said zinc titanate in said catalyst composition.

4,371,729

METHOD FOR THE PREPARATION OF ETHYLBENZENE

Kazuo Shimizu, Yatabe, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,456

Claims priority, application Japan, Feb. 17, 1981, 56-22624

Int. Cl.³ C07C 2/64

U.S. Cl. 585—453 5 Claims

1. A method for the preparation of ethylbenzene by the reaction of methyl alcohol and toluene which comprises bringing a gaseous mixture of methyl alcohol and toluene into contact with a catalyst composed of a carrier of activated carbon or alumina supporting potassium and either one or both of zinc and copper.

4,371,730

DEHYDROGENATION OF ORGANIC COMPOUNDS WITH A ZINC SILICATE CATALYST

Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 5, 1981, Ser. No. 270,697

Int. Cl.³ C07C 5/333, 5/367

U.S. Cl. 585—627 10 Claims

1. A process for the catalytic dehydrogenation of at least one dehydrogenatable organic compound which has at least one

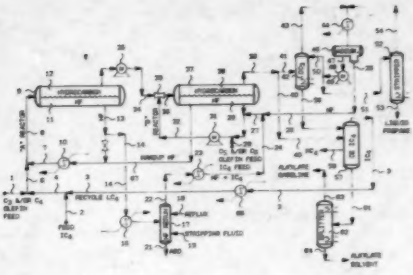
grouping comprising the step of contacting said at least one dehydrogenatable organic compound, under suitable dehydrogenation conditions in the substantial absence of free oxygen with a catalyst composition comprising zinc silicate.

4,371,731

ALKYLATION PROCESS

Stone P. Washer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 4, 1981, Ser. No. 299,427
Int. Cl.³ C07C 2/56
U.S. Cl. 585—716 9 Claims



1. A combination process for production of motor fuel alkylate and solvent alkylate without detriment to motor fuel alkylate quality or quantity which comprises

(a) contacting an isoparaffin with an olefin comprising C_3 and/or C_4 olefins in the presence of an HF acid catalyst in a first alkylation zone under alkylation conditions which produce a motor fuel alkylate,

(b) separating the effluent product of (a) into an HF acid phase containing absorbed isoparaffin and a hydrocarbon phase comprising unreacted isoparaffin, light hydrocarbons, including normal paraffins, motor fuel alkylate, organic fluorides and HF,

(c) regenerating at least a portion of said HF acid phase in (b) in the presence of an isoparaffin under conditions which produce regenerated HF acid containing isoparaffins,

(d) contacting at least a portion of said regenerated HF acid containing isoparaffin with an olefin comprising C_5 and/or C_6 olefins in a second alkylation zone under alkylation conditions which produce solvent alkylate,

(e) mixing said solvent alkylate with said hydrocarbon phase in (b) in a mixing zone under conditions which produce an effluent reduced in said organic fluorides and containing additional alkylate,

(f) separating said effluent in (e) into an HF acid phase and a hydrocarbon phase, and

(g) subjecting said hydrocarbon phase in (f) to fractionation to separately recover alkylate products, isoparaffin, normal paraffins, and HF acid.

4,371,732

ALKYLATION PROCESS

Joe Van Pool, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1981, Ser. No. 297,450
Int. Cl.³ C07C 2/58
U.S. Cl. 585—723 6 Claims

1. An alkylation process comprising the steps of

contacting an olefin stream comprising butylenes containing C_3 hydrocarbons and an isoparaffin comprising isobutane with an HF acid alkylation catalyst under alkylation conditions to form an alkylate-containing alkylation effluent,

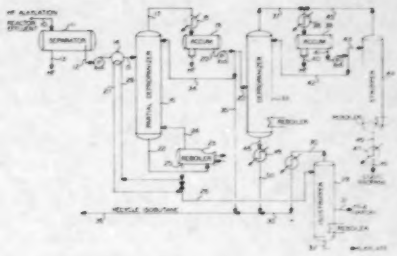
passing said effluent to a phase separation zone and allowing said effluent to separate into a hydrocarbon phase and an HF acid catalyst phase,

passing said hydrocarbon phase to a partial depropanizing zone wherein the hydrocarbon phase is separated into an overhead stream comprising propane, HF, and some isoparaffin, and a bottoms stream substantially free of HF comprising isoparaffin, normal paraffin, and alkylate,

condensing said overhead stream and passing at least a portion of the hydrocarbon condensate formed to a depropanizing zone operated under conditions to recover separately propane, HF, and isoparaffin for recycle to the alkylation,

passing another portion of said condensate as reflux to said partial depropanizer, and

passing the remainder of said condensate as at least a portion of the isoparaffin recycle to said alkylation.



4,371,733

Patent Not Issued For This Number

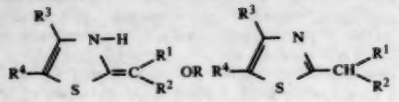
4,371,734

PREPARATION OF THIAZOLE DERIVATIVES

Guenther Seybold, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 1,832, Jan. 8, 1980, abandoned. This application May 1, 1980, Ser. No. 145,790
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801794
Int. Cl.³ C07D 277/20
U.S. Cl. 544—300 4 Claims

1. A process for the preparation of a thiazole derivative of the general formula

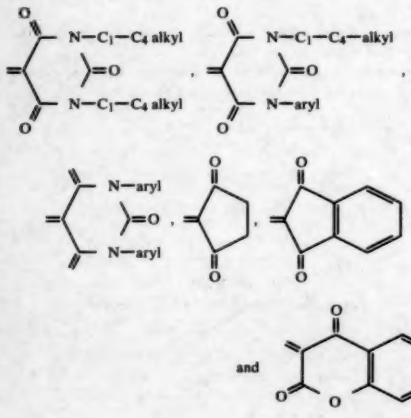


IA IB

where

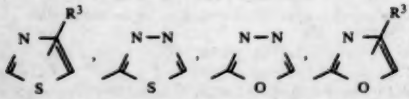
R^1 and R^2 are cyano; formyl; nitro; C_1–C_8 alkanoyl, which is unsubstituted or substituted by chlorine, bromine or C_1–C_4-alkoxy; benzoyl which is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy or cyano; naphthoyl; carboxylic acid ester groups derived from C_1–C_8-alkanols, C_2- to C_8-glycols, C_2–C_8-glycol ethers or phenols; carbamyl or sulfamoyl which is unsubstituted or substituted by C_1–C_8-alkyl, C_1–C_8-alkoxyalkyl, cyclohexyl or phenyl; C_1–C_4-alkylsulfonyl; C_1–C_8-alkylsulfinyl; phenylsulfonyl or phenylsulfinyl;

R^1 and R^2 may also together be a cyclic radical selected from the group consisting of



where aryl is phenyl which is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy or ethoxy; and

R^2 may also be O_2N—C_6H_4, NC—C_6H_4, $CH_3COC_6H_4$,



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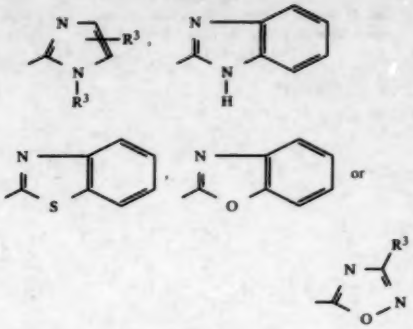
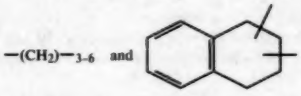


R^3 and R^4 are hydrogen, CH_3, C_2H_5, C_3H_7, C_4H_9, C_5H_{11}, C_6H_5, C_6H_{13}, C_7H_{15}, C_1-bis C_4-alkyl-OC_6H_4, $(C_1$–C_4-alkyl$)_2OC_6H_3$, Cl-$C_6H_4CL_2C_6H_3$, BrC_6H_4, $Br_2C_6H_3$, C_1-C_4-alkyl-S-C_6H_4, H_5C_6S-C_6H_4, C_1–C_4-alkyl-$CONHC_6H_4$, $COOCH_3$, $COOC_2H_5$, $COOC_3H_7$, $COOC_4H_9$, COC_6H_5, $COCH_3$ or CH_2-COO-C_1–C_4-alkyl; and

R^3 and R^4 may also together be a cyclic radical selected from the group consisting of



wherein a compound of the formula II

II

is reacted with a compound of the formula III

III

in the presence of a base selected from the group consisting of alkali metal compounds, alkaline earth metal compounds and amines.

4,371,735

PREPARATION OF PIGMENTS HAVING IMPROVED TECHNOLOGICAL PROPERTIES

Hans Scherer, Weisenheim; Wolfgang Lotsch, Beindersheim, and Gustav Bock, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

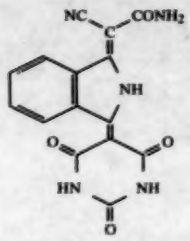
Continuation of Ser. No. 971,061, Dec. 19, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,168

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757982

Int. Cl.³ C09B *57/04*

U.S. Cl. 544—300 **18 Claims**

1. Easily dispersible pigment with high tinctorial strength, of the formula



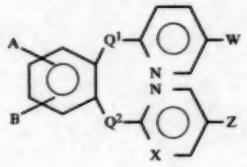
obtained by condensing 1-amino-3-imino-isoindoline with cyanoacetamide at pH >7 and then with barbituric acid at a pH of from 1.5 to 3.5 at from 20° to 150° C., wherein the condensation occurs in the presence of water or in water, and is carried out in the presence of from 5 to 400% by weight based on the barbituric acid, of a surfactant.

4,371,736
HERBICIDAL PYRIDINYLOXY(PYRIMIDINYLOXY)BENZENES

Thomas P. Selby, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1981, Ser. No. 248,345
Int. Cl.³ C07D *239/32*; A01N *43/40*
U.S. Cl. 544—316 **8 Claims**

1. A compound of the formula:



wherein

A is H, NO_2, F, Cl or Br;

B is H, C_1–C_4 alkyl, C_3–C_6 alkenyl, halogen, NO_2, CN, CHO, OR^1, COR^1, CO_2R^1 or SCN;

Q^1 is O or S;

Q^2 is O or S;

X is N or CH;

W is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, F, Cl, Br, NO_2, CN, CF_3 or CO_2R^2;

Z is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, F, Cl, Br, NO_2, CN, CO_2R^3 or CF_3; and

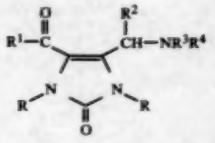
R^1, R^2 and R^3 are independently C_1–C_4 alkyl.

4,371,737
5-AMINOMETHYL-2,3-DIHYDRO-2-OXO-1H-IMIDAZOLE-4-CARBOXYLIC ACID DERIVATIVES

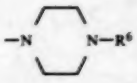
J. Martin Grisar; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed May 4, 1981, Ser. No. 260,445
Int. Cl.³ C07D *241/04*, *233/04*
U.S. Cl. 544—370 **5 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl of 1–4 C, lower alkanoyl of 2–4 C, or benzoyl; R^1 is hydroxy, lower alkoxy of 1–4 C, amino, (lower alkyl)amino, (lower alkyl)$_2$amino or $—NHR_5$ wherein R_5 is phenyl, methylphenyl, dimethylphenyl or methoxyphenyl; R^2 is hydrogen or lower alkyl of 1–4 C; and $—NR^3R^4$ is



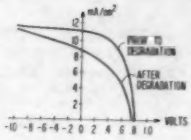
wherein R^6 is lower alky, of 1–4 C, phenyl, halophenyl, methylphenyl, methoxyphenyl or trifluoromethylphenyl; and the pharmaceutically acceptable acid addition salts and the lower alkyl quaternary ammonium salts of the aforesaid compounds.

4,371,738

METHOD OF RESTORING DEGRADED SOLAR CELLS

David L. Staebler, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,170
Int. Cl.³ H01L *31/18*
U.S. Cl. 136—243 2 Claims



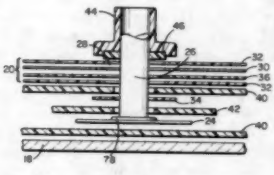
1. A process for restoring the efficiency of an amorphous silicon solar cell, said process comprising annealing the solar cell, whose efficiency has been degraded by long exposure to light, in air at a temperature greater than 100° C.

4,371,739

TERMINAL ASSEMBLY FOR SOLAR PANELS

Kathy Lewis, Canoga Park, and James E. Avery, Burbank, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 16, 1981, Ser. No. 311,816
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—251 27 Claims



1. A solar panel comprising:
at least one solar cell;
an electrically conductive layer located behind the cell and defining an opening through the layer;
a terminal arrangement for establishing external electrical connection to the solar cell, including a substantially flat conductive portion electrically connected to the cell and located between the cell and the conductive layer at a location at least partially overlapping said opening, and a connector portion extending rearwardly from the flat portion through the opening; and
an insulating member of high dielectric strength positioned behind the flat portion and extending about the connector portion to electrically isolate the flat portion from the conductive layer.

4,371,740

CONDUCTIVE ELEMENTS FOR PHOTOVOLTAIC CELLS

Katherine V. Clem, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 171,576, Jul. 23, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,351
Int. Cl.³ H01L *31/06*; B32B *17/06*
U.S. Cl. 136—256 7 Claims

1. A conductive element comprising a soda-lime glass support having directly thereon a layer containing polycrystalline SnO_2 and from about 0.001 to about 5 weight percent of a fluorine-containing dopant, said conductive element being substantially haze-free and having a total transmittance to radiation between 400 and 800 nm greater than 70% and an electrical resistance less than 30 ohm/square.

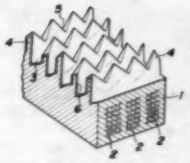
5. A photovoltaic cell comprising contiguous crystalline semiconductive layers and the conductive element of claim 1 in operative, low-impedance contact with at least part of one of said layers.

4,371,741

COMPOSITE SUPERCONDUCTORS

Toshinari Ando; Masataka Nishi; Susumu Shimamoto, all of Tokaimura; Hiromichi Yoshida, Hitachi; Takashi Suzumura, Hitachi; Kimio Kakizaki, Hitachi; Ryozo Yamagishi, Hitachi, and Hisanao Ogata, Shimoinayoshi, Japan, assignors to Japan Atomic Energy Research Institute and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,282
Claims priority, application Japan, Feb. 12, 1980, 55-14788
Int. Cl.³ H01B *7/34, 12/00*
U.S. Cl. 174—15 S 9 Claims



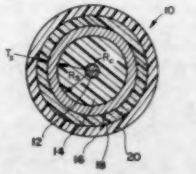
1. A composite superconductor including super-conducting material embedded in normal conducting material and having a surface adapted to be contacted by a refrigerant to cool said composite superconductor, said composite super-conductor further comprising:
a plurality of closely spaced grooves formed in said surface;
a plurality of ridges spaced from each other and defined by said grooves, each said ridge having an outer, acutely tapered end portion;
at least said acutely tapered end portion of each of said ridges having formed therein a plurality of closely spaced notches; and
at least a portion of the surfaces of said grooves, said ridges and said notches being coated with a thin film of metal or metallic compound having a higher heat resistance than that of said normal conducting material.

4,371,742

EMI-SUPPRESSION FROM TRANSMISSION LINES

William A. Manly, Arlington, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Continuation of Ser. No. 862,342, Dec. 20, 1977, abandoned. This application Jul. 19, 1979, Ser. No. 59,047
Int. Cl.³ H01B *11/06*
U.S. Cl. 174—36 48 Claims



1. A flexible transmission line of the type utilized to transmit

electric current in the frequency range of 10^6 to 10^{10} hertz and comprising

(a) an electrical conductor

(b) electrical insulation around said conductor

(c) a metallic sheathing around said electrical insulation and a coating means placed around said sheathing to absorb electromagnetic radiation emanating from said line, in the range of 10^6 to 10^{10} hertz, said means being formed of a shielding composition comprising ferromagnetic particles of above 20 microns in average maximum dimension in a resin matrix and said coating means being of such thickness that it has no substantial interference with the flexibility of said transmission line.

4,371,743

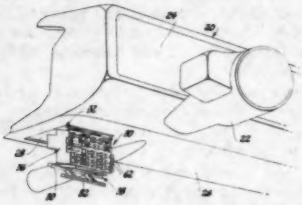
HINGED PULL-DOWN FUSE BLOCK ASSEMBLY

Earl L. Decker, Youngstown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1981, Ser. No. 248,578

Int. Cl.³ B60K *37/00*

U.S. Cl. 174—52 R **5 Claims**



1. A fuse block assembly for an automotive vehicle having an instrument panel which projects toward the driver and has a generally vertical front wall,

said fuse block assembly comprising;

a bracket having a front wall and spaced side walls, said bracket being adapted to be attached to the vehicle behind the front wall of the instrument panel in a generally horizontal position,

a fuse block having one end hinged to the front wall of the bracket for movement about a horizontal axis between a generally horizontal position where the fuse block is stored between the side walls and a generally vertical position where the fuse block hangs below the instrument panel for easy access to replace the fuses and the like carried thereby, and

a manually releasable latch comprising a latch member for holding the fuse block in the stored position and a handle for operating the latch member,

said latch member being attached at the opposite end of the fuse block by a flex arm and engaging the bracket to hold the fuse block in the stored position, and

said handle being attached to the latch member by a rigid spar whereby the latch member moves away from the fuse block to release the latch member from the bracket and permit the fuse block to move to a generally vertical position.

4,371,744

SUBSTRATE FOR INTERCONNECTING ELECTRONIC INTEGRATED CIRCUIT COMPONENTS HAVING A REPAIR ARRANGEMENT ENABLING MODIFICATION OF CONNECTIONS TO A MOUNTED CHIP DEVICE

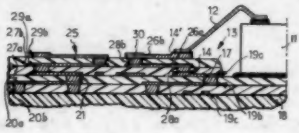
Bernard Badet, Belfort, and Karel Kurzweil, Esubonne, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 948,110, Oct. 3, 1978, abandoned. This application Aug. 27, 1981, Ser. No. 296,835

Claims priority, application France, Oct. 3, 1977, 77 29687

Int. Cl.³ H05K *1/18*

U.S. Cl. 174—68.5 **5 Claims**



1. A substrate for interconnecting electronic integrated circuit components including a repair arrangement enabling modification of a connection to a mounted circuit component without removal thereof comprises:

an insulating layer (**18**),

a first set of alternating, superimposed conductive and insulating layers (**19***a*, **20***a*, **19***b*, **20***b*, **19***c*) overlying said base, said first set of layers including an uppermost first insulating layer (**20***a*) adapted to have mounted thereon an integrated circuit component (**11**) having a plurality of finger-like conductors (**12**) and an uppermost first conductive layer (**19**) having a plurality of contacts (**14**) thereon defining a site location within which the circuit component is mounted,

at least one first interval through connection (**17**) within said site location and associated with at least a predetermined one of said contacts and being interconnected to said predetermined contact via said first conductive layer,

a second set of alternating superimposed conductive and insulating layers (**29***a*, **27***a*, **29***b*, **27***b*) overlying said first set, said second set including an uppermost second insulating layer (**27***b*) and an uppermost second conductive layer (**29***b*), a plurality of contacts (**14'**) on said second conductive layer each adapted to be connected to an associated finger-like conductor (**12**), conductor means for connecting one of said last named contacts (**14'**) to said predetermined contact, said means including at least one second through connection (**28***a*, **28***b*) in each insulating layer of the second set connected between the uppermost second conductive layer (**29***b*) and an internal conductive layer (**29***a*) of the second set, said second through connection having a part external of the site and accessible from the exterior of the substrate whereby the connection between the predetermined contact and the associated finger-like conductor may be modified without removing the mounted circuit component.

4,371,745

SHIELDED WIRE

Masao Sakashita, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Nov. 7, 1980, Ser. No. 204,994

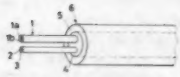
Claims priority, application Japan, Nov. 15, 1979, 54-157547[U]

Int. Cl.³ H01B *9/00*

U.S. Cl. 174—115 **4 Claims**

1. A shielded wire suitable for use with a pressure clip connector, said wire consisting of a first wire having an electrical insulation layer thereon, a ground wire, an electrically-conduc-

tive high molecular material layer covering said ground wire, an electrically-conductive material layer covering both said first wire with electrical insulation layer and said ground wire with electrically-conductive high molecular material layer; and an outer electrically-insulating layer covering said electrically-conductive material layer; said electrically-conductive



high molecular layer and said electrically-conductive material layer being in mutual contact so that they are mechanically separable from each other and are electrically connected to each other; said electrical-insulation layer and said electrically conductive high molecular material layer being substantially equal in thickness and diameter to each other.

4,371,746

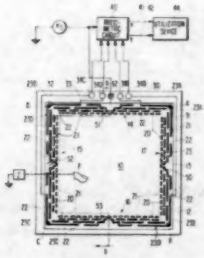
EDGE TERMINATIONS FOR IMPEDANCE PLANES

William Pepper, Jr., Bethesda, Md., assignor to Peptek, Incorporated, Bethesda, Md.

Continuation-in-part of Ser. No. 867,256, Jan. 5, 1978, Pat. No. 4,198,539, which is a continuation-in-part of Ser. No. 759,931, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 14,450, Feb. 23, 1979, Pat. No. 4,293,734. This application Feb. 12, 1980, Ser. No. 120,605

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—18 **9 Claims**



1. In a polygonal impedance surface for converting physical position information on said impedance surface to electrical signals, improvement in edge terminations for said polygonal surface comprising;

a plurality of parallel rows of conductive segments on each edge, respectively, of said polygonal impedance surface, with at least one outermost row conductor segment of adjacent edges being conductively connected together, and a connector terminal for connecting said at least one outermost row conductor of adjacent edges to an external electrical circuit.

4,371,747

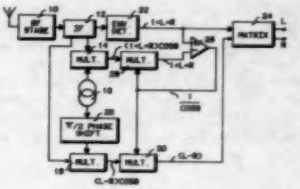
AM STEREOPHONIC DECODER

Francis H. Hilbert, Addison, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 24, 1980, Ser. No. 133,189

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GS **7 Claims**



1. A receiver for receiving AM stereophonic signals of the form $(1+L+R)\cos(\omega_c t+\phi)$ where L and R are information signals, $\omega_c t$ is a carrier frequency, and ϕ is arc tan $\{(L-R)/(1+L+R)\}$, and comprising:

means for selectively receiving said stereophonic signals;

means coupled to the selective receiving means for detecting the amplitude modulation on the received signal;

means for providing two carrier signals in quadrature;

multiplier means coupled to the selective receiving means and to the carrier signal means;

amplifier means coupled to the amplitude detection means and the multiplier means for providing a correcting signal proportional to the inverse of cosine ϕ, said correcting signal being coupled back to the multiplier means for providing a pair of multiplier output signals which are substantially equal to $1+L+R$ and $L-R$; and

matrixing means coupled to receive the signals $(1+L+R)$ and $(L-R)$ and to provide output signals substantially equal to L and R.

4,371,748

DEVICE FOR ARTIFICIAL REVERBERATION

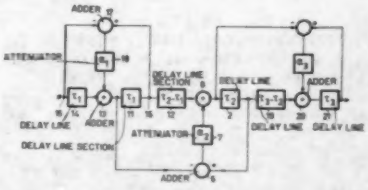
Eise C. Dijkmans, and Kornelis A. Immink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,269

Claims priority, application Netherlands, Apr. 24, 1979, 7903196

Int. Cl.³ G10K *11/00*

U.S. Cl. 179—1 J **17 Claims**



1. Artificial reverberation apparatus comprising first delay means, a first feedback circuit coupling an output of said first delay means to an input thereof to give a feedback factor of less than 1, second delay means having the same delay as does said first delay means and which couples a first circuit point to the input of said first delay means, a first transmission path coupling said first circuit point to the input of said first delay means so as to circumvent said second delay means, the ratio of the transmission factor of the signal path from said first circuit point to the input of said first delay means via said first transmission path to the transmission factor of the signal path from said first circuit point to the input of said first delay means via

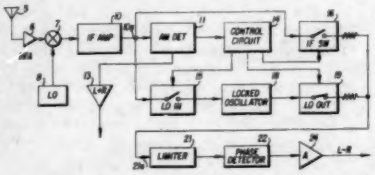
said second delay means being equal but opposite to said feedback factor, third delay means comprising an input portion of the second delay means, a second feedback circuit coupling an output of said third delay means to an input thereof to give a second feedback factor of less than 1, fourth delay means having the same delay as does said third delay means and which couples a second circuit point to the input of said third delay means, and a second transmission path which couples said second circuit point to the input of said third delay means so as to circumvent said fourth delay means, the ratio of the transmission factor of the signal path from said second circuit point to the input of said third delay means via said second transmission path to the transmission factor of the signal path from said second circuit point to the input of said third delay means via said fourth delay means being equal but opposite to the second feedback factor.

4,371,749

CIRCUIT FOR PROCESSING ANGLE MODULATED BROADCAST SIGNALS

Laurel R. Lind, Auburn, Ind., assignor to Magnavox Consumer Electronics Co., Fort Wayne, Ind.

Filed Jun. 13, 1980, Ser. No. 159,360
Int. Cl.³ H04H *5/00;* **H04B** *1/10*
U.S. Cl. 179—1 GS **7 Claims**



1. In a receiver for demodulating angle modulated signals, said receiver having a limiter means for removing amplitude excursions of said modulated signals, a circuit for maintaining said limiter with a signal during negative peak amplitude excursions of said angle modulated signals comprising:

means for detecting a temporary loss in signal during said negative amplitude excursions to said limiter; and

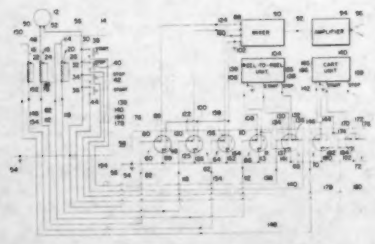
means for generating a substitute input signal having a frequency at substantially the frequency of said modulated signals for said limiter in response to the detection of said temporary loss in signal whereby said limiter supplies an amplitude limited substitute signal during said peak negative amplitude excursions.

4,371,750

MICROPHONE AND REMOTE CONTROL SYSTEM

John B. Markley, 2503 Valley Ave., Marion, Ind. 46952

Filed Jul. 24, 1980, Ser. No. 171,741
Int. Cl.³ G11B *19/16*
U.S. Cl. 179—1 VL **8 Claims**



1. An electrical control apparatus comprising a public address system having a microphone circuit, an amplifier and a speaker for audibly reproducing signals from said amplifier; a first gain control coupled between the microphone circuit and amplifier for controlling the amplitude of microphone signals from said microphone circuit; audio reproduction apparatus selectively connected to said amplifier for generating signals reproducible by said amplifier and speaker concurrently with said microphone signals; a first control function means for controlling the operation of said audio reproduction apparatus; said first control function means including a first switch and a second gain control; a hand-held accessory unit carrying said first gain control and said first control function means, said unit being remotely located with respect to said amplifier, speaker and audio reproduction apparatus; a connecting accessory also remotely located and carrying one or more electrical connecting devices each composed of male and female connectors, said connectors each including conductive contacts, said first gain control and said first control function means including first electrical leads connected between said hand-held unit and predetermined ones of said connecting devices whereby the microphone circuit and said audio reproduction apparatus may be controlled in reproducing audio signals from both concurrently,

said connecting devices further being connected between

(a) said first gain control and said amplifier, speaker and audio reproduction apparatus,

(b) between said first control function means and said amplifier, speaker, and audio reproduction apparatus, and between

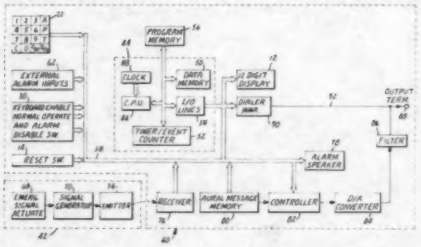
(c) said audio reproduction apparatus and said amplifier.

4,371,751

AUTOMATIC TELEPHONIC USER EMERGENCY MESSAGE TRANSMITTING APPARATUS

William R. Hilligoss, Jr., and Lawrence O. Hilligoss, both of Los Angeles, Calif., assignors to Newart Electronic Sciences, Inc., Minneapolis, Minn.

Filed Apr. 7, 1980, Ser. No. 138,129
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **9 Claims**



1. Apparatus for automatically transmitting over a telephone line aural messages humanly intelligible as spoken words and indicative of a user emergency, comprising a base station including

(i) solid-state message storage means having digitally preencoded therein at least one aural message;

(ii) converter means for providing an analog signal capable of generating an aural presentation of said message;

(iii) keyboard means for inputting digital data representing at least one telephone number;

(iv) signal processing means including

(a) solid-state digital data storage means;

(b) a clock means for providing an alarm-time-signal at a selected alarm time;

(c) means for generating a user-disabled-signal a given length of time after the occurrence of said alarm-time-signal;

(d) control means responsive to said user-disabled-signal for activating said data storage means to provide on an output terminal a signal train capable of initiating automatic dialing of at least one telephone number and for activating said message storage means to transmit on said output terminal said analog signal;

(v) switch means activatable by a user for preventing the generation of said user-disabled-signal; and

(vi) an alphanumeric display coupled to said keyboard means and to said signal processing means for enabling verification of keyboard entered data.

4,371,752

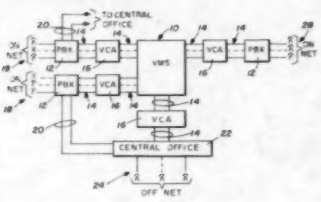
ELECTRONIC AUDIO COMMUNICATION SYSTEM

Gordon H. Matthews, Plano; Thomas B. Tansil, and Michael L. Fannin, both of Dallas, all of Tex., assignors to ECS Telecommunications, Inc., Dallas, Tex.

Filed Nov. 26, 1979, Ser. No. 97,240

Int. Cl.³ H04M *1/66, 3/42, 15/04*

U.S. Cl. 179—7.1 TP **51 Claims**



1. An electronic communication message system for being coupled to any private branch exchange or central office for receiving, storing and forwarding audio messages from users' telephone facilities, comprising:

electronic digital signal processing means for controlling the operation of the message system;

digital memory means controlled by said electronic digital signal processing means for storing digital representations of the audio messages;

means for enabling an originator to access the message system through signals transmitted from a telephone station;

means for controlling unauthorized user access to the message system;

means for storing in said memory means digital representations of audio messages from the telephone station of the originator;

said electronic digital signal processing means including means for timing a predetermined period of time so that the originator may generate an audio message and store digital representations of said audio message in said memory means;

means for storing selected recipient telephone station addresses for digital representations of audio messages stored in said memory means;

means for accessing said stored digital representations associated with particular telephone station addresses;

means for reproducing the audio messages from the stored digital representations; and

means for sequentially transmitting the reproduced audio messages to said selected recipient telephone stations.

42. An electronic communication message system for storing and forwarding audio messages via telephones comprising:

a plurality of ports for being coupled to any private branch exchange or central office to receive audio messages and address signals which represent plural desired recipients from various telephone stations;

means associated with said ports for converting said audio messages and address signals into digital signals;

digital storage means for storing said digital signals representing audio messages and said address signals from each of said ports;

means for accessing all digital signals representing audio messages stored in said storage means and associated with each address signal;

electronic digital signal processing means for controlling the operation of said storage means and said accessing means;

means for converting said access digital signals into audio messages; and

means for sequentially transmitting all audio messages associated with an address signal through said ports to each of said plural desired recipients.

4,371,753

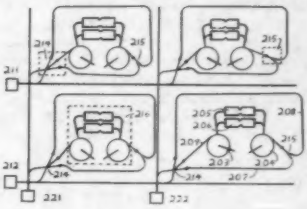
MINIATURE FLUID-CONTROLLED SWITCH

Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932

Continuation of Ser. No. 752,983, Dec. 21, 1976, abandoned. This application Nov. 27, 1978, Ser. No. 963,893

Int. Cl.³ F15C *1/16;* **H01H** *35/26;* **H04Q** *3/42*

U.S. Cl. 179—18 GF **15 Claims**



12. A switching system comprising units, a unit being a group of two or more transmission lines, for example a pair of electrically conducting lines which could cooperate to carry a telephone conversation, some of the units being members of a first set and the rest of the units being members of a second set with no unit being a member of both sets,

a switch associated with each possible special pair of units, a special pair of units being one unit taken from said first set and one unit taken from said second set, the switches and the special pairs being in a one to one correspondence, each switch associated with a given special pair of units connecting one of the units in the pair to the other unit in the pair at all times when the switch is set, and being capable of disconnecting the one unit of the pair from the other unit of the pair when the switch is reset if additionally each unit of the pair is not connected to mutually connected units outside of the pair, the word "connect" meaning enable transmission between, and "the connecting of two units" meaning the connecting of the corresponding transmission lines within one unit to the corresponding transmission lines within the other unit, the switch being either set or reset at all times except during transition between the set and reset states, which states will be further defined later, the said switch associated with a given special pair of units being incapable working alone of connecting any pair of units other than its associated special pair,

the switching system further comprising fluid carrying control lines in a one to one correspondence with the said units, which units are defined above,

and a number of fluid logical devices, one and only one being associated with each switch, so that each said fluid logical device can be thought of as a part of the switch with which it is associated, each fluid carrying control line which corresponds to a given said unit communicating in a fluid sense with each and only those fluid logical devices associated with those switches which are capable acting alone of connecting that given unit with some other said unit, so that for each switch the two control lines, one

corresponding to each unit of the pair of units with which the switch is associated, both communicate directly in a fluid sense with the fluid logical device associated with that switch and those two control lines do not both communicate directly with the logical device associated with any other switch, the word "directly" meaning without both entering and leaving, i.e. flowing through, another of said fluid logical devices,

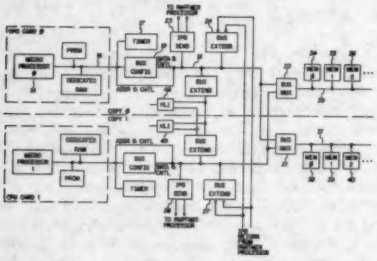
any given switch being set to connect the one unit in the associated special pair of units to the other whenever both fluid control lines entering the fluid logical device associated with the switch are activated for a sufficient time with fluid energy, any given switch being reset to disconnect the associated special pair of units whenever one but not the other fluid control line entering the logical device associated with the switch is activated for a sufficient time, with fluid energy, unless the said pair of units is also connected by means other than the given switch.

4,371,754

AUTOMATIC FAULT RECOVERY SYSTEM FOR A MULTIPLE PROCESSOR TELECOMMUNICATIONS SWITCHING CONTROL

Bimal B. De, Naperville; Lawrence G. Gierut, Lockport; Herbert B. Krakau, Elmhurst; Kirit Naik, Hanover Park, and Eddie Tan-Atichat, Westmont, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 19, 1980, Ser. No. 208,360
Int. Cl.³ G06F *11/20*; **H04M** *3/08*
U.S. Cl. 179—18 EE **29 Claims**



3. In a call switching system control complex, which includes multiple processors each having a processing unit and a memory unit, with at least one of said memory units having an active and a standby copy thereof, a fault recovery system comprising:

means, responsive to the processing unit in one of said processors reading data from a selected location in the active copy of an associated memory unit, for generating a return data parity error indication when the data read contains a parity error;

means for reading standby data from a location, in the standby copy of the associated memory unit, corresponding to said selected location in the active copy and writing the standby data into said selected active copy location; and

means upon a subsequent return data parity error indication in said one processor for switching the standby copy of the memory unit thereof, as available, to active status and the active copy thereof to standby status.

4. In a call switching system control complex, which includes a processor having a processing unit and a memory unit, with said memory unit having an active and a standby copy thereof, each with stored contents, a fault recovery system assuring that said standby copy is in condition to become active when required, comprising:

means, operational in the presence of ongoing call switching by said system, upon determination that call switching activities are presently not required of the processor, for initiating reading and storing a multiple byte portion of the contents of said standby copy;

means for comparing said portion read and stored with the contents of the comparable portion of said active copy; and

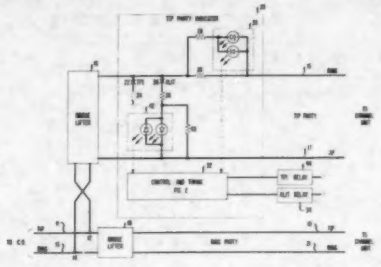
means, in the event said portions do not compare, for correcting the standby copy by writing contents of the active copy to the standby copy.

4,371,755

BRIDGE LIFTER CIRCUIT

Stephen J. Brolin, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 9, 1981, Ser. No. 223,904
Int. Cl.³ H04M *13/00*
U.S. Cl. 179—35 **7 Claims**



1. A two-party telephone circuit for subscriber loop carrier systems comprising

a shared pair of conductors (**11,13**),

a pair of ring party conductors (**19,21**),

a pair of tip party conductors (**15,17**),

a first bridge lifter circuit (**18**) connecting said shared pair of conductors (**11,13**) directly to said pair of ring party conductors (**19,21**),

a second bridge lifter circuit (**16**) connecting inverted shared pair of conductors to said pair of tip party conductors (**15,17**),

automatic number identification circuit means (**20**) connected to said tip party conductors (**15,17**), and

single-party channel means in said subscriber loop carrier system connected to each said ring party and said tip party conductors.

4,371,756

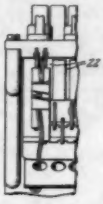
BRIDGE LIFTER MODULE

Michael C. Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,924
Int. Cl.³ H04M *13/00*
U.S. Cl. 179—35 **2 Claims**

1. A bridge lifter module for use in conjunction with a telephone connector block having exposed wire wrap pins for each of the tip and ring circuits of an individual subscriber pair, and a generally elongated projection on said block for each pair adjacent said wire wrap pins, said module, upon installation, being placed in series with said tip and ring circuits, comprising: a molded insulative housing element, said housing element having means for detachably engaging said projection on said block; said housing having a first recess, and an encapsulated bridge lifter circuit element secured within said recess; said housing having second and third recesses, each communicating with said first recess, there being first and second bores in said housing communicating with an outer surface of said housing and said second and third recesses; first and second elongated contact members disposed respectively in said sec-

ond and third recesses, and positioned adjacent the inner ends of said first and second bores to selectively establish electrical communication between said contact members and said wire wrap pins on said block upon engagement therewith, said contact members also electrically communicating with said bridge lifter circuit element; said housing having third and fourth bores extending from outer surfaces of said housing to



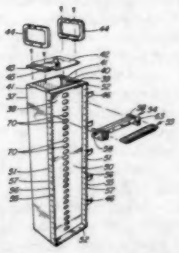
said first recess, and first and second wire wrap pins extending through said first and second bores to establish communication with said bridge lifter circuit element; said module, upon installation, engaging said pair of wire wrap pins on said connector block relating to an individual subscriber circuit in said first and second bores, conductors which normally would be engaging said wire wrap pins being in lieu thereof interconnected to said first and second wire wrap pins on said module.

4,371,757

ENCLOSURE FOR OUTDOOR CROSS-CONNECT SYSTEM FOR TELECOMMUNICATIONS

George Debortoli, Ottawa; Michael V. Meyerstein, Kanata, and Benne Velsher, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 21, 1981, Ser. No. 294,838
Int. Cl.³ H04Q *1/14*
U.S. Cl. 179—98 **20 Claims**



1. An enclosure for outdoor cross-connect apparatus, for telecommunications systems, said enclosure comprising:

a front, back and sides forming a rectangular housing, and a top on said housing;

at least one column in the housing;

cable entry and exit means to said housing; and a door in at least said front of said housing;

said column having a channel shaped back member and a mounting member hingedly attached to the front of the back member;

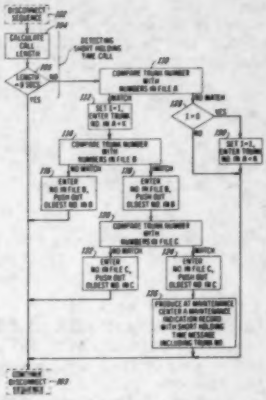
said mounting member having a back panel and forward extending side walls, each side wall having a plurality of slots extending part way from a front edge, and an aperture in each side wall inward of and aligned with each said slot, the slots in each side wall aligned in pairs to position connectors extending across the mounting member, a connector at each pair.

4,371,758

DEFECTIVE SHORT HOLDING-TIME TRUNK IDENTIFYING METHOD

Werner Ulrich, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 8, 1981, Ser. No. 271,366
Int. Cl.³ H04M *3/22, 3/36, 15/00, 15/38*
U.S. Cl. 179—175.2 C **30 Claims**



2. A method of automatically identifying a functional circuit recurrently engaged on short-duration communication calls comprising:

detecting communications of less than a prescribed duration served by said circuit, said detecting step comprising the steps of

calculating in response to a receipt of a call disconnect signal the elapsed time between the occurrence of a call answer signal and said disconnect signal, and

signifying when the calculated elapsed time is less than said prescribed duration;

processing the identity of said circuit through memory in response to the detected communications; and

producing a maintenance indication signifying the processed circuit identity involved in a predetermined plurality of said detected communications less than said prescribed duration.

4,371,759

ENCODING SWITCH

John T. Clark, Jr., Zion, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jan. 7, 1981, Ser. No. 223,116
Int. Cl.³ H01H *9/26*
U.S. Cl. 200—5 R **18 Claims**

1. An encoding switch for generating signals corresponding to the binary bits of a code word, comprising:

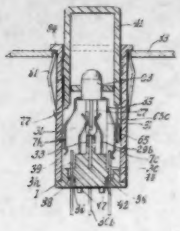
base means for supporting a plurality of pairs of terminals, each pair of terminals including

a conducting stationary terminal and

a conducting movable terminal positioned adjacent said stationary terminal for deflecting to conductively contact the stationary terminal; and

encoding means for slidingly engaging said base means to generate said signals for a particular code word, the encoding means including a plurality of selectively detach-

able tabs, each tab for pressing a corresponding movable terminal into conductive contact with its associated adjacent stationary terminal when the encoding means is slidingly engaged with the base means.

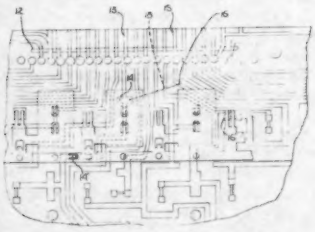


4,371,760

KEYBOARD SWITCH HAVING COMBINED ACTUATOR AND JUMPER CONTACT STRUCTURE

Michael Muller, Newport Beach, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 5, 1981, Ser. No. 240,926
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **15 Claims**



1. In a sandwich type keyboard switch assembly including a printed circuit board with printed circuit conductors thereon, an apertured separator overlying said printed circuit board, a contactor assembly overlying said separator, and a cover layer and indicia member overlying said contactor assembly, an improved contactor assembly comprising:

a plurality of actuators each of which is provided with at least two depending contact fingers, the free ends of which are bent such that they are at least in part substantially parallel to the surface of a printed circuit conductor therebeneath, with the larger portion of the length of said contact fingers disposed at an angle with the plane of said actuator, whereby depression of said actuator will cause said fingers to pass through an aperture in said separator and make electrical contact with the same circuit conductor on said printed circuit board, and further depressing of said actuator will cause the free end of said contact fingers to move laterally across the surface of said circuit conductor;

contact jumper means integrally formed with said plurality of actuators for selectively electrically coupling circuit conductors disposed on said printed circuit board;

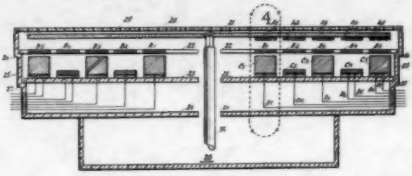
each of said actuators being integrally formed with and electrically connected to a bus.

4,371,761

ELECTRIC DISPATCHERS

David Volcovici, 65-45 Yellowstone Blvd., #1B/T2, Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 925,986, Jul. 19, 1978, abandoned, which is a continuation of Ser. No. 780,057, Mar. 22, 1977, abandoned. This application Mar. 16, 1981, Ser. No. 244,279
Int. Cl.³ H01H *7/00, 19/00, 43/00*
U.S. Cl. 200—27 BA **6 Claims**



1. An Electric Dispatcher or Electric Kaleidoscope switching assembly with magnets for controlling the timing of one minute luminous advertising, luminous displays or other electrically actuated apparatus, the settable and resettable one minute switching system comprising:

a source of electric energy,

a programmable electric clock means for connecting said source to the displays and for controlling the operation of the displays or of other electrically actuated apparatus, the programmable electric clock means further comprising:

(a) a housing means having a clock box compartment and electric program timing connector means compartments disposed in three levels,

(b) said electric program timing connector means compartments having two ledges on said housing means,

(c) a rotatable commutator arm connector activating means detachably mounted to a clockshaft above an electric grate means,

(d) an electric grate means connected to said source of energy supported by the upper ledge of the housing means and consisting of concentric metal rings united by transversal bars, and a sectorized time unit cylindrical plate supporting connector timing means,

(e) said connector timing means mounted in concentric circles on said sectorized time unit plate, said connector timing means consisting of an unmovable part screwed to the underlying plate, and a movable part attached by a hinge to the unmovable part and lying reversed over the unmovable part,

(f) rotation of said rotatable commutator arm connector activating means across any sector of the concentric circles of connector means causing the energizing of unbarred electrical connector means with said grate means, thereby activating desired displays or the like.

4,371,762

CONTACTLESS PRESSURE SENSITIVE SWITCH

John A. Diamond, Glenview, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Jul. 26, 1979, Ser. No. 60,924
Int. Cl.³ H01H *3/16, 9/00;* **E05F** *15/02*
U.S. Cl. 200—61.43 **8 Claims**

7. The combination comprising

a door including a sensitive edge,

said sensitive edge including a resilient, deformable body defining an interior fluid filled chamber,

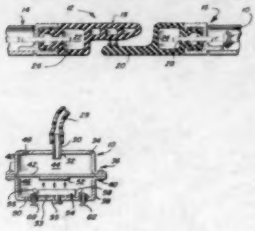
a communicating conduit extending from said chamber,

a switch for recycling said door in fluid communication with said conduit,

said switch including a housing defined by upper and lower housing portions,

a diaphragm mounted in said housing defining first and second chambers in said housing, said first and second chambers being ported to the atmosphere,

a first magnet secured to said diaphragm,



a switching module generating an electrical current pulse actuated by the flux of said first magnet secured in said housing, a second magnet mounted adjacent said module, said second magnet is of a lesser strength than said first magnet.

4,371,763

INERITA SWITCH DEVICE

Peter R. Jackman, Basingstoke, and David W. Crick, Addlestone, both of United Kingdom, assignors to First Inertia Switch Limited, England

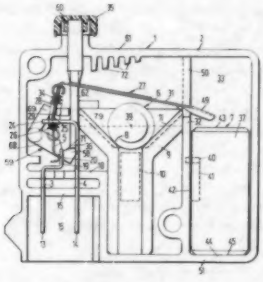
PCT No. PCT/GB80/00117, § 371 Date Mar. 13, 1981, § 102(e) Date Feb. 23, 1981, PCT Pub. No. WO81/00325, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 10, 1980, Ser. No. 243,911

Claims priority, application United Kingdom, Jul. 13, 1979, 7924490

Int. Cl.³ H01H *35/02*

U.S. Cl. 200—61.45 R **17 Claims**



1. An inertia switch device comprising:

(a) an inertia mass which is movable from a rest position when the device is subjected to an applied acceleration or deceleration in a horizontal plane;

(b) means for retaining the inertia mass in the rest position until the applied acceleration or deceleration in a horizontal plane exceeds a threshold value;

(c) a first electrical contact movable between a first stable position in which it engages a second electrical contact and a second stable position in which it no longer engages the second electrical contact;

(d) support means having a bifurcated portion on which is pivotally mounted a bifurcated portion of the first electrical contact;

(e) operating means engageable by the inertia mass on movement of the inertia mass as a result of the applied acceleration or deceleration exceeding the threshold value, to move the first electrical contact from the first to the second stable position, or vice versa;

(f) the operating means comprising a first limb which is struck by the inertia mass when the threshold value is exceeded and a second limb having bifurcated portion which is pivotally mounted on the support means but on the opposite side to the first electrical contact;

(g) resilient biassing means which lies within the bifurcated portions and extends between the first electrical contact and the second limb and can be moved over center so as to bias the first electrical contact towards the first or second stable position depending on the position of the second limb; and

(h) resetting means comprising an operating member arranged to actuate a linkage which engages the resilient biassing means intermediate its ends to push the resilient biassing means over center and thereby return the first electrical contact to its original stable position.

4,371,764

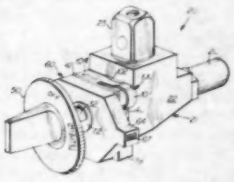
IGNITION CIRCUIT DEENERGIZING SPRING FOR GAS APPLIANCE VALVE-SWITCH

Cleaston L. Runion, Cleveland, Tenn., assignor to Brown Stove Works, Inc., Cleveland, Tenn.

Filed May 28, 1981, Ser. No. 267,747

Int. Cl.³ H01H *9/06*

U.S. Cl. 200—61.86 **10 Claims**

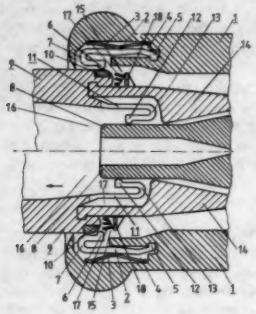


1. In a valve-switch assembly for igniting and controlling the flow of gas to a gas appliance or the like, said valve means including a valve body having an inlet, an outlet, and a valve member rotatably mounted in said body, said valve member being adapted to be manually rotated in opposite directions by a user between a position wherein said valve means is closed and a predetermined position wherein said valve means is substantially fully open, said valve member also having an abutment rotatable therewith, said assembly also including electrical switch means disposed at one end of said valve body and having an operating member rotatable with said valve member, and said electrical switch means also having contact means adapted to be connected to an associated electrical circuit for energizing said circuit and igniting gas being supplied to said gas appliance, the improvement comprising spring means carried by said valve-switch assembly and having an end adapted to be engaged by said abutment when said operating member and valve member are rotated to said predetermined, substantially fully open position, said operating member and valve member also being rotatable to an ignition position beyond said predetermined, substantially fully open position whereat the contacts of said switch are closed, said associated electric circuit is energized, and the flow of gas to said appliance is ignited, said spring means also having a resilient portion adapted to resist rotation of said operating member and said valve member beyond said predetermined, substantially fully open position, and said resilient portion of said spring means also being adapted to automatically rotate said operating member and said valve member from said ignition position to said predetermined, substantially fully open position whenever the torque applied to said valve member by a user to overcome the force of the resilient portion of said spring means is released.

4,371,765
ELECTRICAL SWITCH FOR LARGE CURRENTS

Klaus Ragaller, Neuenhof, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed May 21, 1980, Ser. No. 151,874
Claims priority, application Switzerland, May 25, 1979, 4877/79
Int. Cl.³ H01N 33/18
U.S. Cl. 200—147 R 7 Claims



1. An electrical switch particularly adapted for conducting and breaking large currents, comprising:

a first rotationally symmetric contact piece having an annular recess therein;

a first plurality of contact elements disposed within said annular recess and extending in the axial direction of said first contact piece, each of said contact elements including one end in mechanical and electrical connection with said first contact piece, a contact surface at the other end thereof, and a loop-shaped region between said two ends;

a spring element respectively associated with each of said contact elements for urging said contact element in a radial direction;

a second rotationally symmetric contact piece that is selectively movable relative to said first contact piece from a first position, in which said second contact piece is in mechanical and electrical contact with the contact surface at said other end of said contact elements, to a second position in which said second contact piece is disconnected from said contact elements, whereby an electric arc that is generated during such movement is exposed to the blow-out effect of a magnetic field generated by the flow of current in said loop-shaped regions in said contact elements;

a third rotationally symmetric contact piece that is movable relative to said second contact piece as said second contact piece moves relative to said first contact piece, between said first and second positions;

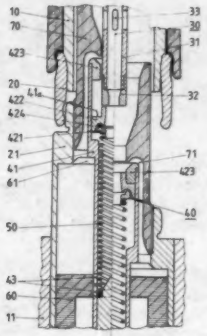
a second plurality of contact elements each having one end connected to one of said second and third contact pieces, a contact surface at the other end thereof that is in mechanical and electrical contact with the other of said second and third contact pieces when the contact pieces are in said first relative position, and a looped shaped region between said two ends through which current flows to generate an arc-extinguishing magnetic field, said points of contact of the other ends of said second plurality of contact elements being displaced relative to those of said first plurality of contact elements such that two-stage commutation occurs during said relative movement from said first to said second position; and

means for quenching an arc disposed in an arc space adjacent the other end of at least one of said pluralities of contact elements.

4,371,766
PUFFER INTERRUPTER WITH TWO-PIECE INTERRUPTER CONTACT

Guido Huser, Birmenstorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Switzerland

Filed Oct. 23, 1980, Ser. No. 199,740
Claims priority, application Switzerland, Oct. 25, 1979, 9576/79
Int. Cl.³ H01H 33/88
U.S. Cl. 200—148 A 5 Claims



1. A puffer interrupter comprising, in combination: an elongated stationary arcing contact, a movable arcing contact assembly including first and second relatively movable members and a lost motion connection for connecting said first and second relatively movable members together, and an operating mechanism connected to said first relatively movable member and moving said first member toward and away from said stationary arcing contact; said first and second members slidably electrically connected to one another; said first member moving said second member into engagement with said stationary arcing contact through said lost motion connection whereby, after said second member impacts said stationary arcing contact, said first member continues to travel relative to said stationary arcing contact; said first member including an arcing ring which is spaced from said stationary arcing contact and which arcs to said stationary arcing contact during closing and before said second member impacts with said stationary arcing contact, whereby the mass of the portion of said movable arcing contact assembly which impacts with said stationary arcing contact during closing is reduced to the mass of only said second member to reduce contact closing bounce.

4,371,767
SMALL-SIZED SWITCH

Shigeo Ohashi, and Hiroyuki Suga, both of Tokyo, Japan, assignors to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 219,774
Claims priority, application Japan, Dec. 31, 1979, 54-182245[U]
Int. Cl.³ H01H 21/12, 21/30
U.S. Cl. 200—335 3 Claims

1. A small-sized switch comprising:

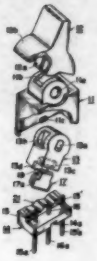
a switch body having a main hollow side portion and an upper portion,

a converter disposed within said switch body at its hollow side portion and slidably engaged with the inner surface of said upper portion of said switch body, said converter provided with a clip-shaped moving contact of an inverted U-shaped form and a spring biased slider,

a knob removaly connected to said converter through the

opening of said upper portion of said switch body so that said converter is operable by said knob, and

a base plate adapted to be fitted in said switch body at its hollow side portion, said base plate being integrally provided with a cam plate for engaging with said slider to spring bias said converter toward said inner surface of said



upper portion and having a plurality of fixed contacts each made of a wire in a round cross section anchored,

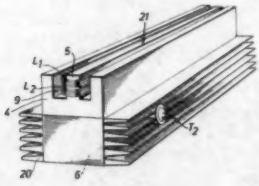
said moving contact adapted to be selectively and simultaneously brought into sliding contact with at least two adjacent fixed contacts of said plurality of fixed contacts to thereby effect switching operations.

4,371,768

ARRANGEMENT FOR THE SEALING OF THERMOPLASTIC-COATED PACKING MATERIAL

Laszlo Pozna, Malmö, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Oct. 22, 1980, Ser. No. 199,504
Claims priority, application Sweden, Oct. 23, 1979, 7908752
Int. Cl.³ H05B 6/44, 6/14
U.S. Cl. 219—10.53 **7 Claims**



1. Apparatus for sealing thermoplastic packing material having an electrically conducting layer, comprising:

a sealing jaw including a magnetically conductive core having an E-shaped cross-section providing a middle limb which terminates at a surface that defines a sealing plane and a recess in said surface on either side of said middle limb that opens into said sealing plane; and

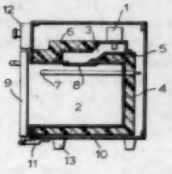
a parallel resonant oscillator circuit comprising a first winding and a capacitor connected in parallel, and further including a second winding inductively coupled to said first winding for controlling the flow of current through said first winding, both said windings being disposed around said middle limb and within the recess in said core adjacent said sealing plane and being substantially entirely surrounded by core structure except for the opening to said sealing plane.

4,371,769

MICROWAVE HEATING APPARATUS

Hirofumi Yoshimura, Nara; Junzo Tanaka, Fujiidera, and Nobuo Ikeda, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 47,997, Jun. 13, 1979, abandoned. This application Jul. 30, 1979, Ser. No. 62,243
Claims priority, application Japan, Jun. 13, 1978, 53/71697
Int. Cl.³ H05B 6/70
U.S. Cl. 219—10.55 F **5 Claims**



1. A microwave heating apparatus comprising:

a heating chamber in which an object to be heated is dielectrically heated by microwaves and having an opening in the top thereof for admission of microwaves;

a microwave generator for generating microwaves which are to be propagated to said heating chamber and disposed above said heating chamber;

a radiant energy heater located within said heating chamber for heating the object to be heated; and

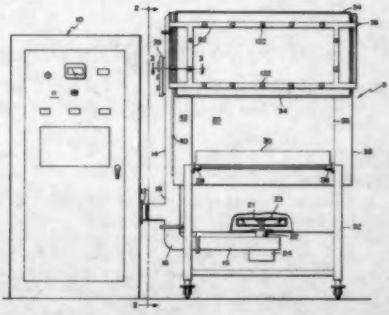
a rectangular wave guide between said generator and said opening for guiding said microwaves generated by said generator into said heating chamber from above, said wave guide being bent generally in the shape of the letter Z and having two bends, said two bends being identical and the distance between said two bends within said wave guide being an odd number multiple of one-quarter of the wave-length of the microwaves within the wave guide and the portion of said wave guide other than the portion adjacent the opening into said heating chamber being spaced from the walls of said heating chamber.

4,371,770

ADJUSTABLE MICROWAVE OVEN DOOR SEAL

Charles L. Gilliatt, Lawrence, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 27, 1980, Ser. No. 201,668
Int. Cl.³ H05B 6/76
U.S. Cl. 219—10.55 D **11 Claims**



1. A microwave oven comprising:

a conductive cavity having an access aperture surrounded by a substantially planar conductive band;

a door covering said access aperture, a region of said door

overlapping said band, said region and said band having spatial separation defining a gap therebetween;

means for energizing said cavity with microwave energy;

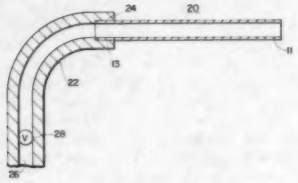
a quarter-wavelength choke communicating with said gap wherein the entrance to said coke is substantially perpendicular to said band; and

means for independently adjusting the distance of said gap at a plurality of locations around said band.

4,371,771
CUTTING TORCH AND METHOD

Ernest C. Faccini, Marbury, Md., and Thomas E. Wergen, Granby, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1980, Ser. No. 205,540
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—70 **12 Claims**



1. In a cutting torch in which a high-velocity flow of a reactive gas is used to promote combustion of a material and thereby removing a portion of said material, the improvement which comprises a barrel comprising an elongated hollow shell; and a single metal selected from the group consisting of aluminum and an aluminum alloy having at least 75 weight percent aluminum contained within said barrel, said aluminum or aluminum alloy having a surface area of at least about 80 sq. cm.

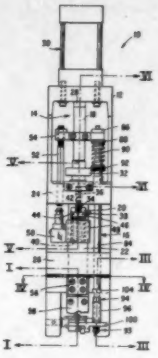
5. In a method for cutting or removing a metal which comprises raising the temperature of a portion of the surface of said metal to at least about 370° C. and impinging upon said portion a high-velocity stream of a reactive gas from a cutting torch wherein said high-velocity flow of a reactive gas promotes combustion of said metal, thereby removing a portion of said metal, the improvement which comprises selecting for said cutting torch a cutting torch which comprises a barrel comprising an elongated hollow shell and a single reactant metal selected from the group consisting of aluminum and an aluminum alloy having at least about 75 weight percent aluminum contained within said barrel, said reactant metal having a surface area of at least 80 sq. cm.

4,371,772
PLURAL SHAFT ELECTRODE SUPPORT FOR FUSING MACHINE

Charles F. Szantho, Roselle Park, and Edward D. Riordan, S. Somerville, both of N.J., assignors to Joyal Products, Inc., Linden, N.J.

Filed Nov. 3, 1980, Ser. No. 203,446
Int. Cl.³ B23K *9/28*
U.S. Cl. 219—89 **18 Claims**

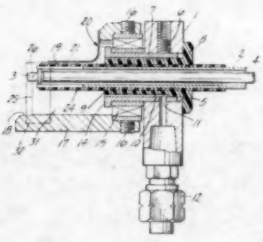
1. A fusing machine, comprising a frame; a fusing electrode assembly mounted for reciprocating movement relative to said frame in a first direction, in which said fusing electrode assembly moves towards a workpiece, and a second direction opposite to said first direction, said fusing electrode assembly including a first fusing electrode shaft, having an open end, a second fusing electrode shaft mounted for reciprocating movement relative to said first electrode shaft in said open end thereof, urging means removably positioned in said open end of said first fusing electrode shaft and interposed between said first fusing electrode shaft and said second fusing electrode shaft for urging said first and second fusing electrode shafts away from each other, holding means attached to said first fusing electrode shaft for holding a fusing electrode, and a stop member adjustably attached to said second fusing electrode shaft, said stop member cooperating with said frame in response to the reciprocating movement of said fusing electrode assembly in said first direction to limit the movement of said second fusing electrode shaft in said first direction; and moving means for moving said fusing electrode assembly in said first and second directions.



4,371,773
STUD WELDING DEVICE

Yoshiteru Kondo, Toyohashi, Japan, assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 54,707, Jul. 5, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,376
Int. Cl.³ B23K *9/20*
U.S. Cl. 219—98 **3 Claims**

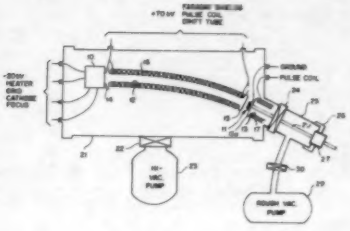


1. A stud welding device comprising a collet having a forward end portion with a tip adapted to hold a stud at the tip of the forward end portion thereof, a rotatable bearing assembly disposed about said forward end portion of said collet spaced from said tip, and a cylindrical welding guide disposed around said forward end portion of said collet and mounted on said bearing assembly for rotation about said collet, said welding guide having a cut-off adjacent its forward end to form a step in said guide, with an opening and an L-shaped cover plate disposed in said cut-off having one leg providing a surface adjacent to and substantially parallel with said collet to form a positioning surface and a second leg providing a surface normal to said positioning surface for covering the opening formed by said step.

4,371,774
HIGH POWER LINEAR PULSED BEAM ANNEALER

Michael D. Strathman, Concord; Devendra K. Sadana, Berkeley, and Richard B. True, Sunnyvale, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 26, 1980, Ser. No. 210,488
Int. Cl.³ B23K 15/00; H05H 7/06
U.S. Cl. 219—121 EA 11 Claims



1. A high power pulsed electron beam system for annealing semiconductor surfaces to a predetermined depth comprising

an electron gun having a hot cathode and a control grid for producing a beam of electrons in response to a control pulse,

an extractor at the output of said gun maintained at a high voltage with respect to said cathode for accelerating electrons,

a first drift tube having an input end and an exit end, said input end for receiving said accelerated electrons, and a first coil surrounding said tube to focus the electrons about the axis of the tube in response to a dc current pulse applied to said first coil for a time spanning said control pulse, said drift tube and coil being maintained at the same voltage as said extractor,

a second drift tube axially aligned with the exit end of said first drift tube for receiving said accelerated and focused electrons, said second tube being spaced a predetermined distance from said first tube, and a second coil surrounding said tube to focus the electrons about the axis of the tube in response to a dc current pulse applied to said second coil for a time spanning said control pulse, the current of said second coil producing a magnetic field greater than the magnetic field produced by current through said first field, said second tube and coil being maintained at a reference voltage between the voltage of said cathode and said extractor,

means for holding a semiconductor to be annealed with its surface positioned in the deceleration region, and within the magnetic field of said second tube, said holding means being maintained at said reference, and

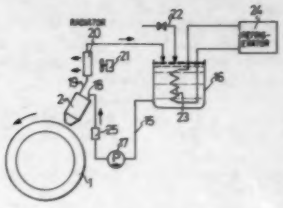
wherein said first drift tube is curved so that the exit end is off axis from the input end thereof, whereby said holding means positions a semiconductor to be annealed out of the line of sight of said cathode.

4,371,775
METHOD AND APPARATUS FOR PLASMA WELDING

Takao Mihara, Matsubara; Toshiaki Morichika, Hirakata, and Shigenori Sone, Nara, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 6, 1981, Ser. No. 251,058
Claims priority, application Japan, Apr. 23, 1980, 55-54802
Int. Cl.³ B23K 9/10
U.S. Cl. 219—121 PK 4 Claims

1. Method for plasma welding comprising the steps of forming a keyhole in the base metals being welded by a plasma arc produced from a plasma welding torch wherein the temperature of the cooling water to be passed into the plasma welding torch at the inlet side of the cooling system is controlled at a set temperature of more than 4° C. and less than 18° C., starting the plasma arc when the cooling temperature reaches the set

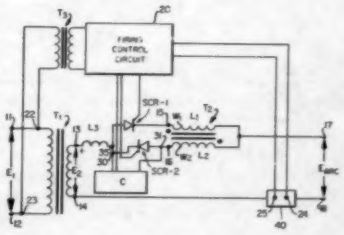


temperature, and starting the relative movement of the base metals and torch upon lapse of a specified time to form a keyhole after starting the plasma arc.

4,371,776
WELDING POWER SUPPLY

Jackie L. Winn, Florence, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 26, 1981, Ser. No. 277,729
Int. Cl.³ B23K 9/09
U.S. Cl. 219—130.51 9 Claims



5. In a controllable power supply for supplying quasi square waves of alternating current to a welding arc between an electrode and a workpiece comprising:

a transformer including a primary winding for receiving a single phase A.C. current from a single phase A.C. power source and at least one secondary winding;

a first welding current path established between opposite ends of said secondary winding including at least one thyristor oriented in said first current path for preventing current flow from said workpiece to said electrode and for selectively rendering said first current path conductive for current flow from said electrode to said workpiece;

a second welding current path established between opposite ends of said secondary winding including at least one thyristor oriented in said second current path for preventing current flow from said electrode to said workpiece and for selectively rendering said second current path conductive for current flow from said workpiece to said electrode;

control means for firing said first current path thyristor for said rendering of said first current path conductive at a selected non-zero value of a positive polarity half cycle of the source voltage when said welding current is flowing from said workpiece to said electrode in said second current path and said first current path is nonconductive;

control means for firing said second current path thyristor for said rendering of said second current path conductive at a selected non-zero value of a negative polarity half cycle of the source voltage when said welding current is

flowing from said electrode to said workpiece in said first current path and said second current path is nonconductive whereby the non-zero value of negative polarity voltage across opposite ends of said first current path secondary winding renders said first current path thyristor nonconductive and the non-zero value of negative polarity voltage across opposite ends of said second current path secondary winding establishes current flow from said workpiece to said electrode;

wherein said control means renders said first and second current paths alternately conducting at each adjacent positive and negative polarity half cycle of the source voltage for supplying current in respectively opposite and mutually exclusive polarities to said arc;

inductor means connected in said first and second current paths such that when current is flowing from said electrode to said workpiece in said first current path said inductor means accumulates energy when the voltage across said opposite ends of said first current path secondary winding is greater than the welding arc voltage and dissipates accumulated energy when the voltage across said opposite ends of said first current path secondary winding is less than the welding arc voltage for self-inducing voltage to maintain current flow from said electrode to said workpiece and when current is flowing from said workpiece to said electrode in said second current path said inductor means accumulates energy when the voltage across said opposite ends of said second current path secondary winding is greater than the welding arc voltage and dissipates accumulated energy when the voltage across said opposite ends of said second current path secondary winding is less than the welding arc voltage for self-inducing voltage to maintain current flow from said workpiece to said electrode;

wherein the energy accumulated by said inductor means substantially equals the energy dissipated by said inductor means over a 360° cycle of said source voltage;

the improvement which comprises:

commutating means connected across said second current path thyristor cathode to anode for selectively rendering said second current path thyristor and thereby said second current path nonconductive whereby said inductor means accumulated energy provides a voltage across said electrode and said workpiece sufficient for reestablishing current flow from said electrode to said workpiece; and

control means for initiating said selective operation of said commutating means substantially simultaneously with said selective firing of said first current path thyristor.

4,371,777

CONTINUOUS FLOW ELECTRIC WATER HEATER

Hanno Roller, Kandel, and Karl-Heinz Nauerth, Erlenbach, both of Fed. Rep. of Germany, assignors to Fritz Eichenauer GmbH and Co. KG, Kandel, Fed. Rep. of Germany

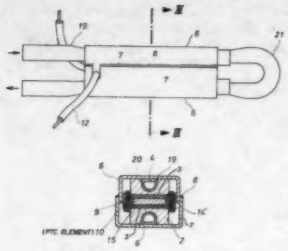
Filed Dec. 3, 1980, Ser. No. 212,451

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1979, 2948591

Int. Cl.³ F24H *1/12*; H05B *3/02*

U.S. Cl. 219—298 **14 Claims**

1. A continuous flow heater having a compound heating structure made up of at least two elongated generally parallel-piped-like shaped bodies of material with a high thermal conductivity, each such body having at least one heat input face and a fluidway running through it for fluid to be continuously heated, the bodies being positioned side-by-side with a heat input face of each body facing a heat input face of the next adjacent body and with the fluidways parallel to each other, at least one heating element positioned between each pair of facing heat input faces, and a casing forcing the bodies together with the heating element therebetween, wherein said casing is made up to two elongated channel-like casing halves, each half being U-shaped in cross section and having two side flanges running out from a floor part along the length of said bodies, the flanges of one casing half being permanently fixedly joined with those of the other casing half along substantially the entire length of the flanges so that the bodies and the heating element



within the casing are acted upon by a force, transmitted by said casing through said bodies, normal to said facing heat input faces.

4,371,778

ELECTRIC HEATING DEVICE EMPLOYING PTC HEATING ELEMENT FOR PREHEATING OF HEATING OIL

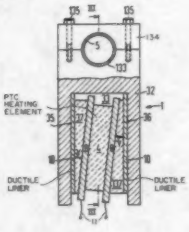
Hans Meixner, Haar, and Andreas Schebler, Wuerzburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,285

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840242

Int. Cl.³ F02M *31/12*; H05B *1/02, 3/14*

U.S. Cl. 219—302 **3 Claims**



1. A heating device for the preheating of heating oil in a range from 0.3 to 2.5 liters/hour which comprises:

a heat conduction body having portions defining an interspace within said body;

a plate-shaped ceramic PTC resistance heating element received in said interspace and providing good heat conduction from both planar surfaces of said heating element, said ceramic PTC conductor heating element having a thickness of between 0.5 and 2 mm, a Curie temperature of between 120° and 220° C., and consisting of material having a specific resistance, ρ, of 430 to 5,000 ohm-cm, as measured at a voltage between 110 and 220 volts and at the Curie temperature of said material;

means for attaching said heat conduction body in heat exchange-relationship to a pipe conveying the oil to be heated; and

means for connecting said element to an electrical power source having a voltage between 110 and 220 volts,

whereby said heating device may be used to heat heating oil flowing in the pipe such that the maximum temperature attained by said heating element over a range of heat transfer rates from said heat conduction body is relatively constant and

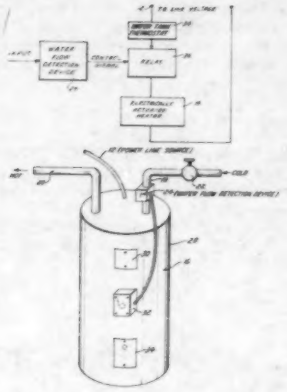
is determined by the resistivity and Curie temperature of the ceramic material and not by the rate of heat transfer.

4,371,779

ENERGY SAVING WATER HEATER CONTROL CIRCUIT

Arthur D. Maynard, P.O. Box 95, and Joseph L. Abrams, 960 Apple La., both of Altamonte Springs, Fla. 32701

Filed Sep. 19, 1980, Ser. No. 188,975
Int. Cl.³ H05B 1/02; F24H 9/20
U.S. Cl. 219—328 4 Claims



1. In a hot water heater having a tank provided with a cold water inlet and a hot water outlet and electrically operated heating means for heating water in said tank, the improvement comprising a control circuit for controlling operation of said heating means in response to water usage, said control circuit comprising a detection means for sensing water flow in one of the cold or hot water lines, thermostat means responsive to the temperature of the water in the tank for controlling operation of said heating means to heat said water to a predetermined temperature and thereafter deactivating said heating means, said control circuit including an electrically operated relay in circuit with said heating means and energized by said detection means to energize said heating means upon detection by said detection means of water flow indicative of the withdrawal of hot water from said tank, holding circuit means simultaneously energized with said relay by said detection means for maintaining said relay and heating means energized even should the flow of water stop, said thermostat means being in series with said relay and said holding circuit means and arranged to permit energization of said relay and holding circuit means only if the water in said tank is below the said predetermined temperature.

4,371,780

MULTI-ELEMENT COOKING UNIT WITH CONTROL DEVICE

Gerhard Gossler, Oberderdingen; Heinz Petri, Bretten, and Hans Mayer, Kurnbach, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Berate Blanc u. Fischer, Fed. Rep. of Germany

Filed Oct. 23, 1980, Ser. No. 199,948
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943477; May 14, 1980, 3018416
Int. Cl.³ H05B 1/02
U.S. Cl. 219—446 8 Claims

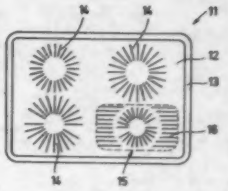
1. A glass ceramic cooking unit, comprising:

a glass ceramic hob having a substantially circular main heating element and at least one additional heating element arranged adjacent the main heating element, the main and the at least one additional heating elements together forming an elongated rectangular configuration;

a rotatably mounted setting shaft, rotatable over an angular range for regulating the heating elements;

a cam fixed on the setting shaft for rotation therewith, the cam having a shoulder extending therefrom;

a cam plate rotatably mounted on the setting shaft, the cam plate having an arcuate slot, defining the angular range, for slidably receiving the shoulder of the cam, the cam plate being rotatably driven by the cam whenever the shoulder engages either end of the arcuate slot, the cam and cam plate being otherwise relatively rotatable; and,



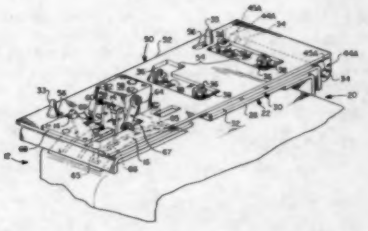
switching means having contacts operable in response to rotation of the cam plate into contact therewith, the setting shaft, cam, cam plate and switching means together forming a control device for the main and at least one additional heating elements, rotation of the setting shaft in the angular range regulating the main heating element, rotation beyond the angular range activating the at least one additional heating element, and further rotation thereafter in the angular range regulating both the main and at least one heating elements together.

4,371,781

APPARATUS FOR INTERCONNECTING AN ACTUATOR AND A POSTAGE METER

Charles M. Weimer, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 11, 1980, Ser. No. 167,518
Int. Cl.³ G07G 1/00; B23Q 17/00
U.S. Cl. 235—101 5 Claims



1. Apparatus for interconnecting a postage meter and means for operating the postage meter, wherein said postage meter includes a lever which is positionable in a plurality of postage value selecting positions, said meter operating means includes a support, and said meter operating means includes means removably attachable to said support for positioning said postage meter lever, said apparatus comprising:

a. means for adjusting the spatial relationship between said postage meter and said meter operating means, and

b. means for fixing the spatial relationship between said postage meter lever and said lever positioning means, said fixing means including lever extension means fixedly attachable to said postage meter lever, and said lever exten-

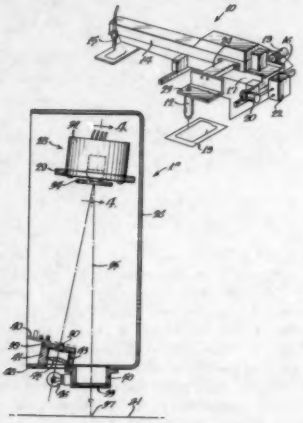
sion means including slidable means locatable in a predetermined position with respect to said adjusting means.

4,371,782

OPTICAL PATTERN TRACING SYSTEM WITH REMOTELY CONTROLLED KERF AND FORWARD OFFSETS

Frans Brouwer, 410 Greenwood Ave., Glencoe, Ill. 60022

Filed Dec. 31, 1979, Ser. No. 108,549
Int. Cl.³ G05B *1/00*
U.S. Cl. 250—202 **24 Claims**



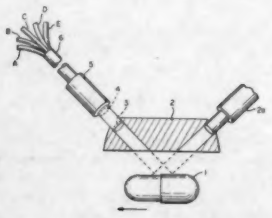
20. An optical pattern tracer, comprising; a frame mounted for movement along two coordinates, power operated means for moving the frame along the two coordinates, an optical scanning assembly for scanning the pattern and providing control signals for the power operated means, said scanning assembly including an optical deflector having pure nutating motion without rotation for projecting a scan spot in a circular path on the pattern.

4,371,783

MULTICHANNEL FIBER OPTIC LIGHT GUIDE FOR CAPSULE INSPECTION

William C. Grimmell, Lake Hiawatha, and Gilbert C. Kaetzel, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 3, 1980, Ser. No. 203,290
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **5 Claims**



1. A fiber optic arrangement for detecting certain properties of a capsule by utilizing focussed light reflected from the capsule comprising:

(a) a fiber optic guide having a plurality of channels of optical fibers joined together at an end to form a common end and the other end of each channel being free, said common end being positioned to receive the focussed reflected light from the capsule, and the optical fibers of each channel being substantially evenly distributed over the common end;

(b) mask means covering the common end of the channels for masking a portion of the light reflected from the capsule and having a first aperature with a curved configuration located and dimensioned to permit only light reflected from a predetermined section of the capsule to pass to the channels;

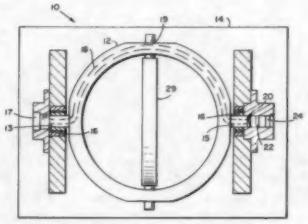
(c) detecting means associated with the free end of the channels for obtaining a plurality of electrical signals from the light passing through channels and detecting the color of the capsule, the signals representing the response of the capsule to the light.

4,371,784

THIN FILM PLANE-POLARIZED INTENSITY PICKOFF

Aubrey Rodgers, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,261
Int. Cl.³ G01C *19/28*; G02B *5/30, 27/28*
U.S. Cl. 250—231 GY **3 Claims**



1. A thin film plane-polarized intensity pickoff assembly comprising:

a. a housing;

b. an outer stablized gimbal having a first pair of hollow shafts secured thereto and to said housing;

c. an inner gimbal having a second pair of shafts secured thereto and to said outer gimbal;

d. fiber optic means carried in the first of said hollow shafts, extending through said outer gimbal and into the second of said hollow shafts;

e. light emitting means mounted on said housing adjacent said first hollow shaft for directing unpolarized radiant energy through said fiber optic means;

f. polarizer means mounted on the end of the second of said hollow shafts for receiving said source of unpolarized radiant energy for polarization thereof;

g. analyzer means for receiving and directing said polarized energy from said polarizer whereby the intensity of said polarized energy directed through said analyzer means varies with the angle of rotation of said hollow shafts; and

h. detector means for receiving said polarized energy for said analyzer.

4,371,785

METHOD AND APPARATUS FOR DETECTION AND ANALYSIS OF FLUIDS

Norman E. Pedersen, Wilmington, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Aug. 14, 1980, Ser. No. 178,190
Int. Cl.³ G01N *21/26*
U.S. Cl. 250—343 **26 Claims**

1. A photometric analysis apparatus for analyzing a fluid

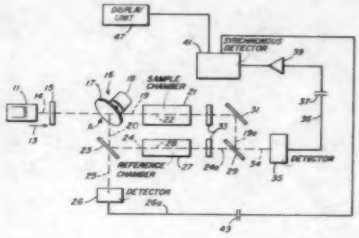
medium having at least one sample component having a characteristic absorption wavelength of interest, comprising:

a beam source of electromagnetic radiation including radiation at least at said one characteristic wavelength and at a reference wavelength,

a fluid sample chamber having an optical path passing therethrough,

means for positioning said chamber in the path of said beam for passing said beam through said chamber along said optical path,

means for modulating said beam exiting said chamber for



forming at least first and second time-varying component beams,

first filter means in the path of the first component beam for passing substantially only radiation of said characteristic wavelength,

second filter means in the path of the second component beam for passing radiation at at least said reference wavelength and not including said characteristic wavelength,

means for combining said first and second wavelength component beams exiting said respective filter means, and

means for measuring selected characteristics of said combined beam.

4,371,786

METHOD AND APPARATUS FOR DETECTING BUBBLES IN A LIQUID

Donald L. Kramer, Indian Harbor Springs, Fla., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 29, 1980, Ser. No. 201,736

Int. Cl.³ A61M 5/16

U.S. Cl. 250—343 **28 Claims**

1. In the method of detecting the presence of bubbles in a liquid by sensing the effect of absorption by the liquid of radiation directed therethrough, the improvement which markedly increases the differential between the amount of radiation transmitted along a radiation path through the liquid when a bubble is not present in the radiation path and a greater amount of radiation transmitted through a bubble in the liquid present in the radiation path, comprising directing along said radiation path radiation having wavelength greater than 1.0 micrometer, and detecting the radiation having a wavelength greater than 1.0 micrometer which has traversed said radiation path.

4,371,787

ION-NITRIDING APPARATUS

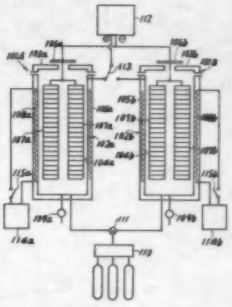
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Furuitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 751,328, Dec. 16, 1976, abandoned. This application Jan. 18, 1979, Ser. No. 4,613

Claims priority, application Japan, Dec. 19, 1975, 50-158107; Jan. 14, 1976, 51-3471; Feb. 16, 1976, 51-16379; Mar. 1, 1976, 51-22382; Mar. 1, 1976, 51-22383; Mar. 19, 1976, 51-30381; Jun. 1, 1976, 51-64370; Jun. 1, 1976, 51-64371; Jun. 1, 1976, 51-71326

Int. Cl.³ C23C 11/14

U.S. Cl. 422—186.06 **2 Claims**



1. An ion-nitriding apparatus comprising:

(a) a plurality of separate vacuum reacting furnaces, each of which is separately provided with both glow discharge means and heating means;

(b) a power source device for heating, separately provided for each heating means of each vacuum reacting furnace, whereby each heating means is able to generate heat independently of each other heating means; and

(c) a DC source device for discharge which is provided in common to each glow discharge means of each vacuum reacting furnace, said single power source device working on a continuous basis to alternatively operate each glow discharge means to cause discharge means to generate glow discharge.

4,371,788

ENERGY DEVICE POWERED BY THE MOTION OF WATER BENEATH WAVES

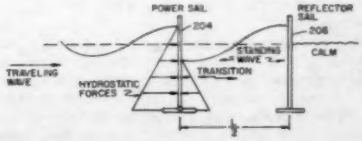
E. Quimby Smith, Jr., Graeagle, Calif., assignor to Q Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 56,186, Jul. 13, 1979, which is a continuation-in-part of Ser. No. 861,967, Dec. 19, 1977, Pat. No. 4,170,738. This application Jun. 26, 1980, Ser. No. 163,033

The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.

Int. Cl.³ F03B 13/12

U.S. Cl. 290—42 **29 Claims**



1. Apparatus for extracting energy from the motion of water beneath a traveling wave in a body of water comprising a power member capable of being moved by the water, means for supporting said power member in said body of water with

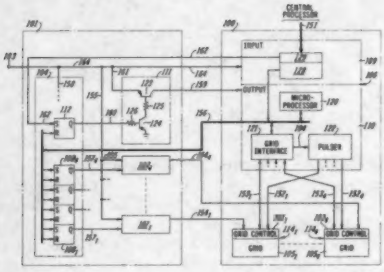
at least a substantial portion thereof beneath the surface of the waves in a manner such that said power member can be moved back and forth by the movement of water beneath the waves, means operatively connecting said power member to a conversion device to transfer the energy extracted by said power member to said conversion device, a secondary member, and means supporting said secondary member in said body of water with at least a substantial portion thereof beneath the surface of the waves at the leeward side of said power member and spaced therefrom a distance such that it receives energy transmitted through said power member and returns some of the received energy back to said power member to work in conjunction with said power member as a unit.

4,371,789

POWER CONTROL ARRANGEMENT

I-Heng Chen, Naperville, and Warren A. Liss, Aurora, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 2, 1981, Ser. No. 269,573
Int. Cl.³ G05B *9/02*; H02H *7/00*
U.S. Cl. 307—38 **14 Claims**



1. A power control arrangement for use in a processor-controlled switching system having a central processor for generating peripheral unit control signals, a plurality of peripheral units operative in response to said peripheral unit control signals to perform operations defined by said control signals, and a power source terminal;

said power control arrangement comprising:

a plurality of power switches operative to connect said power source terminal to said peripheral units; and

power control means responsive to said peripheral unit control signals for selectively operating said plurality of power switches to connect said power source terminal only to those of said peripheral units designated to be operated by said control signals.

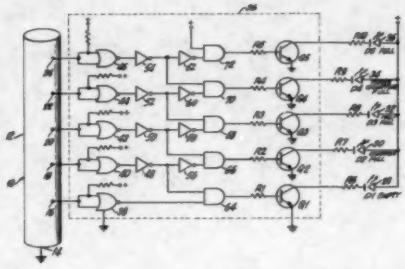
4,371,790

FLUID MEASURING SYSTEM

John J. Manning; Robert E. Rosin, both of San Jose, Calif., and Ralph M. Richart, Tenafly, N.J., assignors to RMR Systems, Inc., Santa Clara, Calif.

Filed Sep. 19, 1980, Ser. No. 188,929
Int. Cl.³ H01H *35/18*; G01F *23/22*
U.S. Cl. 307—118 **2 Claims**

1. An apparatus for indicating the level of an electrically-conductive liquid, said apparatus comprising a carrier member, a reference contact attached to a reference position at substantially the lowermost part of said carrier member and connected to a reference potential, said carrier member being adapted to be placed in the liquid whose level is to be determined to an extent that at least said reference contact is below the surface of the liquid, a plurality of sensors attached to said carrier and positioned above said reference position of said reference contact, said sensors being vertically spaced on said carrier member and normally electrically insulated from one another and from said reference contact, the liquid into which said carrier member is placed being effective when the liquid extends between said reference position and the level of one or more of said sensors to effect electrical connection between said reference contact and said one or more of said sensors, thereby to operatively connect said one or more of said sensors to said first reference contact and thereby to said reference potential, a plurality of indicating means, and logic means interposed between said indicating means and said plurality of sensors and effective to selectively actuate at least the one of



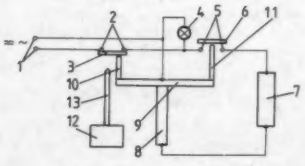
said indicating means which is operatively connected to the upper most of said plurality of sensors that is below the surface of the liquid, said logic means comprising a plurality of switching means respectively connected to said indicating means and effective when it receives a drive signal to cause the actuation of the corresponding one of said indicating means, and a plurality of logic gates operatively respectively interposed between said plurality of sensors and said switching means and effective to provide a drive signal to a selected one of said switching means corresponding to the uppermost one of said plurality of sensors below the liquid.

4,371,791

TIME DELAY SWITCH

Olivier Mercier, Ennetbaden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 6, 1981, Ser. No. 280,487
Claims priority, application Switzerland, Jul. 8, 1980, 5206/80
Int. Cl.³ H01H *7/00*
U.S. Cl. 307—141 **1 Claim**



1. A time delay switch capable of connecting for a predetermined time period a consuming device to a power source via a first current path, comprising:

a first normally open circuit breaker including stationary and movable contacts adapted to be connected in series with said consuming device and said power source in said first current path;

an auxiliary normally closed circuit breaker having stationary and movable contacts connected in series with said first circuit breaker and said power source in a second current path;

a thermal element made of a memory alloy characterized by

a two way temperature sensitive shape changing characteristic and having a predetermined thermal capacity;

a resistor electrically connected in series with said thermal element and thermally coupled thereto, said thermal element and said resistor connected in series with said first and second circuit breakers and said power source in said second current path, said thermal element having respective tripping pins mechanically coupled to the movable contacts of said first and second circuit breakers; and

a push button activator coupled to the movable contact of said first circuit breaker and having a tripping pin capable of being manually translated to make a temporary electrical connection between the stationary and movable contacts of said first circuit breaker;

whereby when said push button activator makes said temporary electrical connection between the stationary and movable contacts of said first circuit breaker, a current is generated in said first and second current paths producing a heating of said thermal element and a corresponding shape change thereof such that the tripping elements of said thermal element move to maintain the electrical connection of the movable and stationary contacts of the said first circuit breaker and disconnect the stationary and movable contacts of said second circuit breaker such that the current in said second current path is interrupted, whereupon heating of said thermal element ceases and said thermal element returns to its shape prior to heating thereof after a predetermined time period whereupon the first circuit breaker returns to its normally open state and the second circuit breaker returns to its normally closed state.

4,371,792

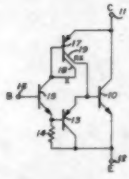
HIGH GAIN COMPOSITE TRANSISTOR

Robert C. Dobkin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 24, 1980, Ser. No. 171,778

Int. Cl.³ H03K *17/60, 3/26;* **H01L** *27/02*

U.S. Cl. 307—255 **11 Claims**



1. An integrated circuit for providing a composite transistor action, said composite performing as a single three terminal transistor that displays high gain, low leakage, and stable operation over a wide frequency band, said circuit comprising:

first, second, and third circuit terminals representing respectively the collector, emitter, and base of said composite transistor;

a first transistor of a first conductivity having its emitter-collector circuit coupled in series between said first and said second terminals and a base;

a second transistor of complementary conductivity having a collector returned to said second terminal, an emitter coupled to drive said base of said first transistor, and a base;

a third transistor of said first conductivity having an emitter coupled to drive said base of said second transistor, a base connected to said third terminal and a collector; and

a fourth transistor of said complementary conductivity having an emitter returned to said first terminal, a base coupled to be driven by said collector of said third transistor, and a collector coupled to drive said base of said first transistor.

4,371,793

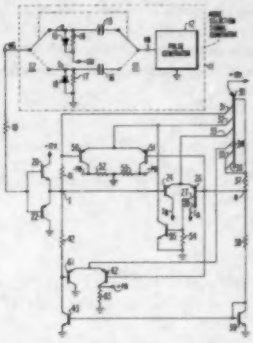
DUAL-MODE CONTROL SIGNAL GENERATING APPARATUS

Mark B. Knight, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,104

Int. Cl.³ H03K *3/023*

U.S. Cl. 307—260 **7 Claims**



1. Dual-mode control signal generating apparatus for (1) supplying to a plurality of outputs a first array of control signals in response to delivery to an input terminal of an input pulse train accompanied by a DC component of a first magnitude, and (2) supplying to said outputs a different array of control signals in response to delivery to said input terminal of said input pulse train accompanied by a DC component of a second magnitude; said apparatus comprising:

a reference current path including a first resistor in series with a second resistor;

means for supplying a reference current to said reference current path;

first, second, third and fourth transistors, each having base, emitter and collector electrodes;

means for interconnecting the emitter electrodes of said first and second transistors;

a first control current path connected to a collector electrode of said first transistor;

a second control current path connected to a collector electrode of said second transistor;

means for supplying a first energizing current to said interconnected emitter electrodes of said first and second transistors;

means for (1) causing flow of a substantially unvarying control current in one of said control current paths to the exclusion of the other in the presence of input pulse train accompaniment by a DC component of said first magnitude, and for (2) causing flow of a substantially unvarying control current in said other of said control current paths to the exclusion of said one in the presence of input pulse train accompaniment by a DC component of said second magnitude; said flow causing means comprising means for rendering the potential at the base electrode of said first transistor responsive to the potential at said input terminal, and means for rendering the potential at the base electrode of said second transistor responsive to the potential at the junction of said first and second resistors;

means for interconnecting the emitter electrodes of said third and fourth transistors;

means for supplying a second energizing current to said interconnected emitter electrodes of said third and fourth transistors;

a load impedance coupled to a collector electrode of said fourth transistor; and

means for causing output pulse train development across said load impedance only in the presence of input pulse

train accompaniment by a DC component of said second magnitude; said output pulse train development causing means comprising:

means for rendering the potential at the base electrode of one of said third and fourth transistors responsive to the potential at the junction of said first and second resistors;

a third resistor;

current mirror means responsive to said reference current for causing flow of a translating current, proportional to said reference current, through said third resistor; and

means for connecting said third resistor between said input terminal and the base electrodes of the other of said third and fourth transistors.

4,371,794

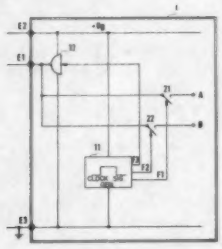
MONOLITHIC INTEGRATED CIRCUIT

Wolfgang Gollinger, Gundelfingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,070

Int. Cl.³ H03K *5/13, 3/335*

U.S. Cl. 307—269 **5 Claims**



1. A circuit, comprising:

a clock signal generator with at least one outer terminal, to which may be applied one of several potentials selectable by way of outside connections, the outer terminal (E1) is applied optionally to one of four potentials of which the first one is that of the supply voltage source U_B, of which the second one is that of the zero point of the circuit, of which the third one is that of the outer terminal (E1) itself without any outside connections, and of which the fourth one is that of the output of a square-wave signal generator (4), the clock signal generator (11) produces at least three square-wave clock signals (F1, F2, F3) of equal frequency of which the first and second ones each have a pulse-interval ratio smaller than unity and which are phase-shifted with respect to one another by 180°, while the pulse duration (t3) of the third one is longer than that of the first one and overlaps it, the outer terminal (E1) is applied to the output of an inverter (12) to the input of which there is fed the third clock signal (F3) and, moreover, via a first electronic make contact (21) to the control input of which there is fed the first clock signal (F1) to a first circuit point (A) and, via a second electronic make contact (22) to the control input of which there is fed the second clock signal (F2) to a second circuit point (B), and the output resistance of the inverter (12), in the two switching states thereof is high with respect to the internal resistance of the square-wave signal generator (4).

4,371,795

DYNAMIC MOS-LOGIC INTEGRATED CIRCUIT COMPRISING A SEPARATE ARRANGEMENT OF COMBINATORY AND SEQUENTIAL LOGIC ELEMENTS

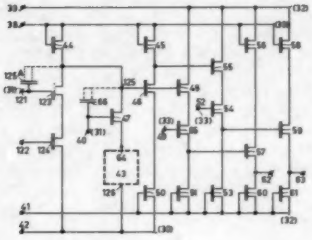
Cornelis Mulder; Leendert Nederlof; Cornelis Niessen; Rene M. G. Wijnhoven, all of Eindhoven, Netherlands, and Roelof H. W. Salters, Sunnyvale, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1979, Ser. No. 73,571

Claims priority, application Netherlands, Sep. 15, 1978, 7809397

Int. Cl.³ H03K *19/08, 19/12*

U.S. Cl. 307—440 **6 Claims**



1. An integrated circuit in dynamic MOS technology, comprising:

clock input means for receiving repetitive clock cycle signals, each cycle having a succession of first, second and third clock phase signals; a plurality of single bit hold circuits (DFF), each having:

a first data input;

an input gate fed by said first data input and having first control means for being rendered transmitting by a first clock phase signal;

an intermediate gate fed by said input gate and having second control means for being rendered transmitting by a second clock phase signal next to said first clock phase signal;

at least a first output gate fed by said intermediate gate and having third control means for being rendered transmitting by a third clock phase signal next to said second clock phase signal and having a first data output;

a set of logic gates having second inputs for receiving a second plurality of binary signals as generated on said first data outputs and therefrom producing by combinatory logic means a third plurality of binary signals on second data outputs coupled to respective first data inputs while being enabled by said first clock phase signal in coincidence with said input gate of said single bit hold circuits;

having a succession of first, second, third and fourth clock phase signals;

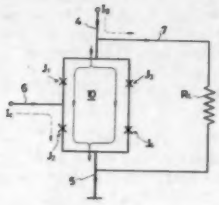
at least one of said single bit hold circuits having a second output gate fed by said intermediate gate and having fourth control means for being rendered transmitting by a fourth clock phase signal next to said third clock phase signal and having a third data output connected to a further one of said second input, wherein the signals on the first and third data outputs of a same single bit hold circuit are mutually inverse.

4,371,796

JOSEPHSON LOGIC GATE DEVICE

Susumu Takada, Musashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,855
Claims priority, application Japan, Aug. 27, 1979, 54/108129
Int. Cl.³ H03K 19/195, 17/92
U.S. Cl. 307—476 4 Claims



1. A Josephson logic gate device comprising;
four superconductor lines (1)
four insulating films (2) connecting said four superconductor lines with each other at their ends (E_1–E_8) to form four Josephson junctions (J_1–J_4), said four superconductor lines (1) and said four insulating films (2) together constituting a closed loop provided with said Josephson junctions (J_1–J_4),
a gate line (4) connected to a first one (1*a*) of said superconductor lines,
a control line (6) connected to a second (1*b*) or fourth one (1*d*) of said superconductor lines, one end (E_3, E_8) of each of said second and said fourth superconductor lines (1*b*, 1*d*) being connected via said insulating film to said first superconductor line (1*a*), and
a ground line (5) connected to a third one (1*c*) of said superconductor lines, both ends (E_5, E_6) of which are connected via said insulating film to the other ends (E_4, E_7) of said second and fourth superconductor lines (1*b*, 1*d*), whereby the device acts as a switching gate in which a gate current fed to said gate line is steered to a load connected to said gate line (4) and said ground line (5) by using the zero-voltage/voltage state-transition of said four Josephson junctions (J_1–J_4) when a control current is injected into said control line (6) as an input signal.

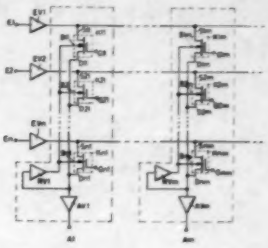
4,371,797

CIRCUIT FOR DECREASING THE EFFECT OF PARASITIC CAPACITANCES IN FIELD EFFECT TRANSISTORS USED IN COUPLING NETWORKS

Dieter Frank, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,318
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917989
Int. Cl.³ H03K 17/16, 17/693; H04N 5/21; H04Q 3/52
U.S. Cl. 307—577 7 Claims

1. In a network for selectively coupling each of a plurality of input lines (E1 . . . En) to a plurality of output lines (A1 . . . Am), said coupling network comprising a plurality of field effect transistors each having a source-drain circuit connected between one of said input lines and one of said output lines, a gate terminal and a bulk terminal, said source-drain circuit switching to the conductive state in response to a control signal applied at said gate terminal, thereby providing an output signal on the associated one of said output lines in response to an input signal on the associated one of said input lines, the said output signal being derived from the signal transmitted across the respective source-drain circuit of the FET from the input line to the output line when the said FET is activated by said gate control signal, the improvement comprising means (RV1 . . . RVm) connected to said bulk terminals and at least one of said output lines for applying a compensation signal to said bulk terminals of at least selected ones of said field effect



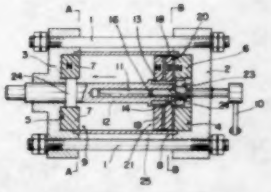
transistors, said compensation signal being derived from said output signal on said at least one output line, and being applied in a form compensating and substantially reducing the effect of parasitic capacitance between said source-drain circuit and said bulk terminals of said field effect transistors.

4,371,798

MAGNETIC CYLINDER

Takeshi Kuroda, 7-12, Higashishioya-cho, Kure-shi, Hiroshima-ken, Japan

Filed Mar. 18, 1980, Ser. No. 131,469
Claims priority, application Japan, Mar. 26, 1979, 54-36136; Jun. 30, 1979, 54-90443[U]
Int. Cl.³ H02K 7/06
U.S. Cl. 310—80 7 Claims



1. A piston assembly comprising:
a slidably mounted piston rod;
a first magnetic unit mounted to said piston rod so as to be axially movable therewith, said magnetic unit including a plurality of segments of alternating polarity in the direction of rotation about the axis of said piston rod;
means for rotationally moving said first magnetic unit with respect to the axis of said piston rod; and
a second fixedly mounted magnetic unit, said second magnetic unit opposing said first magnetic unit and including a plurality of segments of alternating polarity in the direction of rotation about the axis of said piston rod, said first and second magnetic units disposed such that they will attract or repel each other, thereby causing linear movement of said piston rod, when said first magnetic unit is rotated into a selected position.

4,371,799

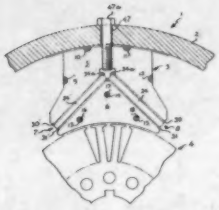
PERMANENT MAGNET FIELD POLE FOR A DIRECT CURRENT DYNAMOELECTRIC MACHINE

Frank T. De Wolf, and Dan W. Kimberlin, both of Erie, Pa., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 845,457, Oct. 25, 1977, Pat. No. 4,141,137. This application Feb. 9, 1979, Ser. No. 10,580

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **6 Claims**



1. In a dynamoelectric machine comprising a flux conducting stator, a plurality of salient field poles mounted on said stator, and a rotor concentrically mounted between said poles for rotation relative thereto, the improvement wherein each of said field poles comprises a rigid laminated base member, a relatively more flexible laminated face member wherein the laminations are held together by, and are individually pivotable about, a plurality of rods extending through spaced apertures through the face member, and one or more rare earth magnet sub-assemblies mounted between the base member and the face member and secured between said members by mounting means.

4,371,800

VIBRATING LINEAR MOTOR FOR ELECTROMAGNETIC FEEDERS AND SIMILAR MACHINES

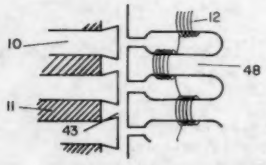
James E. Brander, Strathfield, Australia, assignor to International Combusion Australia Limited, Australia

Continuation of Ser. No. 950,988, Oct. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 736,319, Oct. 28, 1976. This application Jun. 17, 1981, Ser. No. 274,509

Claims priority, application Australia, Mar. 11, 1975, PC3816

Int. Cl.³ H02K *33/00*

U.S. Cl. 310—15 **6 Claims**



1. An electromagnetic vibratory motor comprising:

an armature having a plurality of magnetic poles spaced apart along the direction of action of the motor, said poles having flat pole faces generally parallel to said direction of action forming a plane and having gaps therebetween which are smaller than the width of the pole faces;

a spring means attached to said armature;

a stator having a plurality of magnetic poles spaced apart along the direction of action of said motor, the shapes of both said armature and said stator poles being substantially identical, each being symmetrical about an axis drawn through its face normal to said direction of action of said motor, the pole pitch of said stator poles being the same as that of said armature poles, said armature and said stator poles being closely adjacent relative to the distance between the axis of symmetry of adjacent ones of said armature and said stator poles with said stator poles arranged symmetrically about the centres of respective ones of said armature poles in the rest position wherein the centres of gaps between adjacent ones of said stator poles are located opposite the centres of respective ones of said armature poles;

said armature and stator pole arrangement being such that the respective gaps on either side of the motor between the plane of the armature pole faces and the plane of the opposed stator pole faces remain of substantially constant width during translation of the armature;

means to energize said stator poles; and

means to energize said armature poles.

4,371,801

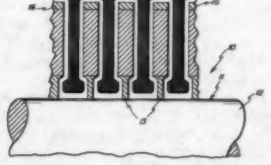
METHOD AND APPARATUS FOR OUTPUT REGULATION OF MULTIPLE DISK PERMANENT MAGNET MACHINES

Eike Richter, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 950,317, Oct. 11, 1978, abandoned. This application Jan. 12, 1981, Ser. No. 223,962

Int. Cl.³ H02K *19/26*

U.S. Cl. 310—156 **15 Claims**



1. In a permanent magnet excited disk-type synchronous generator having a plurality of stator winding disks with distributed multiphase, multiturn windings thereon, and a plurality of rotor disks rotatable about an axis having permanent magnets mounted thereon and oriented in such a fashion that the magnetic flux is directed axially through the mahcine, the improvement comprising:

means for controllably rotating alternate ones of said stator winding disks about said axis with respect to adjacent stationary stator winding disks to place distributed windings in the rotated stator disks in a preselected angular orientation relative to the distributed windings in said stationary stator winding disks to control the field flux density of the generator to control the generator output voltage.

4,371,802

HALF-PITCH CAPACITOR INDUCTION MOTOR

Wayne J. Morrill, 3448 S. Washington Rd., Fort Wayne, Ind. 46804

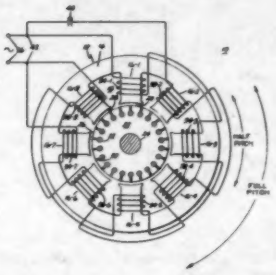
Continuation-in-part of Ser. No. 155,104, Jun. 12, 1980, abandoned, which is a continuation of Ser. No. 934,902, Aug. 18, 1978, abandoned. This application Jun. 8, 1981, Ser. No. 271,667

Int. Cl.³ H02K *17/00*

U.S. Cl. 310—166 **12 Claims**

1. In a single phase, permanent split capacitor induction motor including a stator core member having a plurality of substantially equally angularly spaced, radially inwardly extending teeth respectively defining winding slots therebetween, said teeth having inner ends defining a bore, a rotor

member in said bore having a peripheral surface defining air gaps with said inner end of said teeth and having generally axially extending slots formed therein, a squirrel cage winding in said rotor member slots extending between the ends of said rotor member, a main field winding on said stator core member, said main winding forming a predetermined even number of magnetic poles, an auxiliary field winding on said stator core member mechanically angularly displaced from said main field winding and forming the same number of magnetic poles, means for coupling said windings for energization by a single phase source of alternating current, and a phase-displacing capacitor coupled in circuit with one of said field windings thereby providing a two-phase motor: the improvement



wherein said inner ends of said teeth have equal angular extent and said teeth are equal in number to twice the number of said poles, said main field winding comprising a plurality of coils equal in number to the number of said poles, said main field winding coils respectively embracing alternate consecutive ones of said teeth, said auxiliary field winding comprising a plurality of coils equal in number to the number of said poles, said auxiliary field winding coils respectively embracing consecutive alternate teeth respectively intermediate said first-named alternate teeth, there being one coil only on each said tooth thereby providing a half-pitch winding for said motor, said main and auxiliary field windings having substantially equal ampere turns and substantially equal pitch thereby providing a balanced two-phase winding.

4,371,803

COMMUTATOR BRUSH HOLDER QUADRATURE SPRING

Arnold Schindel, Fairlawn, and John A. Caspar, Verona, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 29, 1980, Ser. No. 191,896

Int. Cl.³ H02K *13/10*

U.S. Cl. 310—242 **7 Claims**

1. A motor commutator brush holder assembly comprising:
means for retaining a single brush therein;
at least first and second biasing means mounted in the brush retaining means and disposed in right angled overlying relation to each other, the biasing means contacting a brush end opposite the end adapted for contacting a commutator,
thereby urging the brush into full contact with the commutator during motor operation.

4,371,804

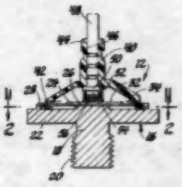
PIEZOELECTRIC KNOCK SENSOR

Yuchi P. Peng, Noblesville; Gerald O. Huntzinger, Anderson, and Melvin H. Hallmann, Middletown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1981, Ser. No. 288,910

Int. Cl.³ H01L *41/10*

U.S. Cl. 310—321 **5 Claims**



1. A broadly tuned knock sensor for an internal combustion engine subject to knock-induced vibrations within an engine determined frequency band, the sensor comprising, in combination:
mounting means defining a peripherally bounded surface having an axis, said surface, with the mounting means affixed to the engine, partaking of the knock induced vibrations; and
a piezoelectric element affixed to the surface, the element comprising a resilient vibratable portion extending radially outward from the surface by different distances when measured in two non-parallel radial directions in the plane of the surface so that the element exhibits resonant vibrations in a plurality of modes having resonant frequencies relatively closely spaced within the engine determined frequency band to substantially span said band, the element further comprising piezoelectric voltage generating means effective to generate an electrical voltage signal representation of said vibrations.

4,371,805

ULTRASONIC TRANSDUCER ARRANGEMENT AND METHOD FOR FABRICATING SAME

Heinrich Diepers, Höchstadt, and Bertram Sachs, Erlangen-Büchenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 168,243

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929541

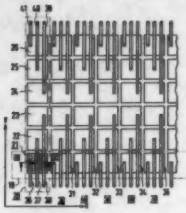
Int. Cl.³ H04R *17/06*; G01S *15/00*

U.S. Cl. 310—334 **5 Claims**

1. In a ultrasonic transducer arrangement with a plurality of ultrasonic oscillators, each formed by a plurality of transducer elements which are mechanically separated from each other by fine division and are electrically controlled together, the improvement comprising:
a. the ultrasonic oscillators each including a matrix of column-like transducer elements which are arranged in columns one behind the other and in rows side by side;
b. the oscillators arranged in columns and rows;
c. a common electrical connecting lead connected to one end face of all transducer elements, the other end face of the transducer elements of each individual ultrasonic oscillator provided with a common electrical connection

which is connected to a connecting lead, one lead thereby being provided for each individual ultrasonic oscillator; and

d. said common electrical connection for each individual oscillator comprising a metal coating on a plastic covering which covers the free end faces of the transducer ele-



ments, one of said metal coatings formed in the area of the matrix of each individual ultrasonic oscillator, said covering having an opening for each oscillator, and each connecting lead comprising a conductor run on top of said plastic cover and extending through the opening for an associated oscillator into contact with said metal coating.

4,371,806

LUMINESCENT SCREEN WITH GRID STRUCTURE FOR X-RAY IMAGE INTENSIFIER

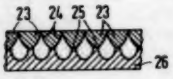
Werner Bintig, Erlangen, and Hermann Christgau, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,091

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2229745

Int. Cl.³ H01J *40/00;* **G01T** *1/20*

U.S. Cl. 313—101 **8 Claims**



1. In an X-ray image intensifier,

a luminescent input screen arranged for receiving an X-ray image, and

utilization means coupled with said luminescent input screen for producing an intensified image in accordance with the X-ray energy absorbed by the input screen,

said luminescent input screen comprising an X-ray permeable carrier for transmitting an X-ray image from a first side thereof to a second side thereof, and having a grid structure at the second side thereof, and

a luminescent layer vacuum deposited onto the grid structure to exhibit a grid pattern and having a thickness dimension in the direction of the incident X-ray image for absorbing X-ray energy after transmission through the carrier,

characterized in that

said grid structure comprises point regions arranged in a grid configuration with interstices surrounding each of the point regions,

said interstices being etched into the material of said carrier, and said luminescent layer being vacuum deposited onto the point regions so as to form columns extending from the respective point regions a distance representing the thickness dimension of the luminescent layer.

4,371,807

INCANDESCENT LAMP WITH MECHANICALLY ATTACHED BASE

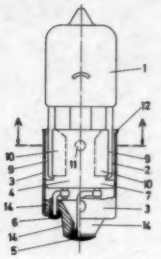
Frizt Eckhardt, Herbrechtingen-Bolheim, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,349

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938189

Int. Cl.³ H01J *5/48, 5/50*

U.S. Cl. 313—318 **4 Claims**



1. Incandescent lamp having a lamp bulb (1) and a press seal (2) joined to the lamp bulb;

a tubular base shell (3) of essentially circular cross section; and means for securing the lamp bulb in the base shell comprising

a sleeve-like insert (4) snugly matching the inner diameter of the base shell (3) said insert including

an annular bottom (7) fitted within the base shell;

the sleeve-like insert being diametrically severed to form diametrically opposite sleeve portions defining upstanding flaps (9) having part-cylindrical portions extending along the side walls of the base shell, the end portions of said upstanding flaps being bent inwardly of the sleeve-like insert, to form inwardly facing wings (10),

said wings resiliently abutting and being pressed against the press seal;

and an interlocking projection and recess means formed in one of the flap (9) and in the base shell to lock said sleeve-like insert (4) and said base shell (3) together and to prevent rotation of the sleeve like insert relative to the base shell.

4,371,808

ONE-GUN TWO-BEAM CATHODE RAY TUBE

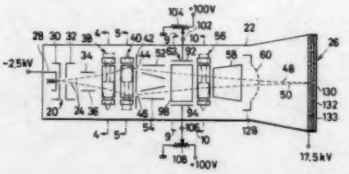
Tadao Urano, Hachioji, and Isamu Kaneko, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,484

Claims priority, application Japan, Dec. 7, 1979, 54-159008

Int. Cl.³ H01J *29/50*

U.S. Cl. 313—411 **5 Claims**



1. A one-gun two-beam cathode ray tube comprising:

(a) an envelope having a target screen;

(b) an electron gun for producing an electron beam directed toward the target screen;
(c) a first quadrupolar electron lens disposed along the path of the beam for diverging the beam in a first direction and for converging the beam in a second direction, the first and the second directions being at right angles with each other;
(d) a second quadrupolar electron lens disposed along the path of the beam from the first electron lens for converging the beam in the first direction and for diverging the beam in the second direction;
(e) beam separator means disposed across the path of the beam from the second electron lens and defining a pair of apertures equidistantly spaced from, and aligned in the first direction with, the geometrical center of the cross section of the incident beam, whereby two separate fractions of the incident beam are admitted through the apertures to provide first and second display beams of smaller cross sectional size;
(f) a first pair of deflection plates for deflecting the first display beam from the beam separator means in the first direction;
(g) a second pair of deflection plates for deflecting the second display beam from the beam separator means in the first direction;
(h) focus corrector means disposed along the paths of the first and the second display beams from the first and the second pairs of deflection plates, the focus corrector means comprising first and second opposed pairs of electrodes which are arranged in generally boxlike configuration and which are separated from one another, the first opposed pair of electrodes being spaced from each other in the first direction and so positioned that the first and the second display beams pass the opposite sides of the midpoint between the first pair of electrodes, the second opposed pair of electrodes being spaced from each other in the second direction to an extent necessary for the passage of each display beam, the first pair of electrodes being set at a potential higher than the potential of the second pair of electrodes, whereby the first and the second display beams are diverged in the first direction to a greater extent as the display beams pass closer to the respective electrodes of the first pair;
(i) a third quadrupolar electron lens for diverging the first and the second display beams from the focus corrector means in the first direction and for converging the first and the second display beams in the second direction; and
(j) a third pair of deflection plates for deflecting the first and the second display beams from the third electron lens in the second direction.

4,371,809

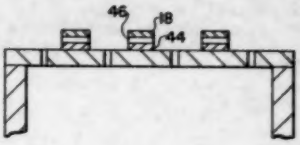
INTEGRAL-SHADOW-GRID CONTROLLED-POROSITY DISPENSER CATHODE

Richard E. Thomas, Riverdale, Md.; George A. Haas, Alexandria, Va., and Richard F. Greene, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1980, Ser. No. 161,183
The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.
Int. Cl.³ H01J *29/46, 19/42*
U.S. Cl. 313—449 **5 Claims**

1. In a controlled-porosity-dispenser cathode of the type having a foil with a plurality of holes placed on the surface of a reservoir of electron-emitting material so that electron-emitting material is dispensed through the holes to the electron-emitting surface of the foil over a small area surrounding the holes and electrons are emitted from the holes and said small area surrounding the holes, and having a control grid spaced from the foil to control the emission of electrons, the improvement comprising:

an integral shadow grid formed upon the surface of the foil, the grid configuration being such that no holes in the foil are covered by the shadow grid and such that the control grid will be in substantially exact alignment with the



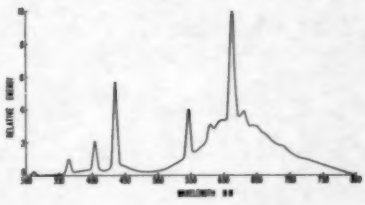
shadow grid, the shadow grid material being of a type which does not emit electrons at the operating temperature of the cathode.

4,371,810

PLANT GROWTH TYPE FLUORESCENT LAMP

Richard Corth, Nutley, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 5, 1980, Ser. No. 146,888
Int. Cl.³ H01J *1/62, 63/04*
U.S. Cl. 313—487 **5 Claims**



1. A luminescent discharge lamp to efficiently stimulate balanced plant growth, said lamp comprising an elongated light-transmitting envelope, phosphor means as the primary light-generating media coated on the interior surface of said envelope, and means for producing a low-pressure mercury discharge within said envelope to energize said phosphor means to a light-generating condition, said phosphor means when energized exhibiting a predetermined emission spectrum, and the combined emissions of said phoshor means and the visible emissions from said discharge which pass through said envelope having a spectral energy distribution such that the emission energies are principally confined to the 400–500 nm, 590–640 nm, 640–690 nm, and 690–800 nm bands and within these bands are at least within about 15% of being within the proportions of 1:2.6:1.3:1.2 which can also be expressed as in the following table:

Wavelengths	Ratio	Equivalent Percentages	Plus or Minus 15%
400–500 nm	1	16.4	13.9 to 18.9%
590–640 nm	2.6	42.6	36.2 to 50%
640–690 nm	1.3	21.3	18.1 to 24.5%
690–800 nm	1.2	19.7	16.7 to 22.7%
	6.1	100.0	

4,371,811
ELECTRONIC FLASH GUN STRUCTURE

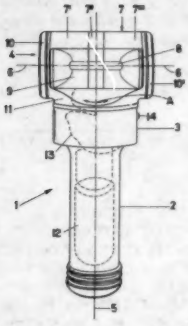
Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fuer elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,904

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 8003592[U]

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P 2 Claims



1. Electronic flash gun structure having an essentially linear flash tube (8);

a reflector (7) having sectional portions (7',7'', 7''') of which at least some are rotatable about an axis coincident with the central axis (6) of the flash tube;

a cylindrical housing (4) surrounding and retaining in position said flash tube (8) and said reflector (7), and formed with a transparent window portion (9) for transmission of light flashes from the tube;

and a support and apparatus chamber structure supporting said cylindrical housing and retaining electrical apparatus components for operation of the flash tube (8),

wherein said support and apparatus chamber structure comprises

a tube (2) closed at one end and defining a tube axis (5);

a flange-like cylindrical head portion (3) formed at the other end defining a support platform, and extending transversely to the axis (5) of the tube;

and said cylindrical housing (4) comprises

an attachment flange (11) defining an attachment plane positioned parallel to said central axis (6) and perpendicular to said tube axis (5), integral with said housing (4) and of cylindrical shape which matches and fits on the cylindrical head portion (3) of said tube (2);

said flange-like head portion (3) and the attachment flange (11) being rotably joined to place the support platform and the attachment plane in parallel position and relatively rotatable about said axis (5) of the tube;

and wherein the central axis (6) of the flash tube, about which some of the sectional reflector portions are rotatable, and the tube axis (5) of the tube (2) have a common intersection to position the cylindrical housing (4) symmetrical with respect to the tube axis (5) of the tube.

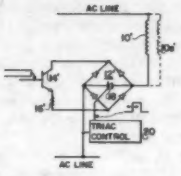
4,371,812
LIGHT REGULATION SYSTEM

Don F. Widmayer, Bethesda, Md., assignor to Controlled Environment Systems, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 27,740, Apr. 6, 1979, Pat. No. 4,234,820, and a continuation-in-part of Ser. No. 945,842, Sep. 26, 1978, abandoned. This application Jun. 22, 1979, Ser. No. 51,136

Int. Cl.³ H05B *41/392*

U.S. Cl. 315—291 9 Claims



1. A light regulating system comprising:

at least one gas discharge lamp operating in the arc discharge region thereof,

a ballast connected from an AC supply line to said at least one lamp, and

a transistor control unit for controlling the current flow through said ballast, said transistor control unit including a control transistor and control means for controlling said transistor so as to provide operation of said transistor in the linear region thereof such that the waveform of the current supplied to said ballast during each half cycle comprises a first, low amplitude component corresponding to the minimum arc current for said at least one lamp and for additionally providing that said waveform of said current includes a second, variable duration component corresponding to maximum arc current, the duration of the second current component being a function of the controlled lighting in the area in which said at least one lamp is located.

4,371,813
CIRCUIT ARRANGEMENT FOR MOVING A MARKER OVER THE PICTURE SCREEN

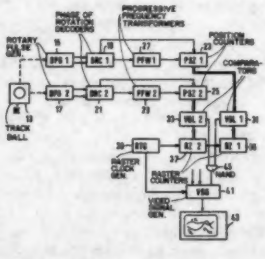
Jürgen Dollheimer, and Klaus Knoll, both of Karlsruhe, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,361

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932564

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—377 13 Claims



1. In a circuit arrangement for moving a marker over the picture screen of a display device including:

(a) a positioning transmitter;

(b) a pulse generator mechanically coupled to said position-

ing transmitter such that, upon actuation of said positioning transmitter pulses of switchable frequency are generated;

(c) a position counter for each coordinate in which the marker is moveable, the stored value of which corresponds to the position of the marker on the picture screen and the counting direction of which is controllable according to the desired displacement direction on the coordinate, coupled to receive pulses from said position transmitter, the improvement comprising:

(d) the pulse generator being a rotary pulse generator, one being provided for each coordinate and mechanically coupled to the positioning transmitter, said rotary pulse generator providing output pulses; and

(e) a progressive frequency transformer for each coordinate which delivers a number of output pulses for each input pulse, said number increasing with the frequency of the input pulses, said progressive frequency transformer having the output pulses of an associated rotary pulse generator as an input and providing its output to the position counter for that coordinate.

4,371,814

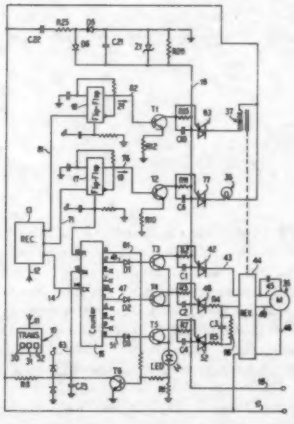
INFRARED TRANSMITTER AND CONTROL CIRCUIT

James R. Hannas, Thiensville, Wis., assignor to Silent Running Corporation, Clearwater, Fla.

Filed Sep. 9, 1981, Ser. No. 300,498

Int. Cl.³ H04R *7/02*

U.S. Cl. 318—16 **7 Claims**



1. An infrared control system for a ceiling fan motor or other load comprising, an infrared transmitter with keying switches for transmitting directional infrared energy, an infrared receiver and decoder for receiving and decoding the output of said transmitter, a counter connected to receive an output of said receiver and decoder, a first transistor connected between a first output of said counter and a second input of said counter, a second transistor connected to a second output of said counter, a first TRIAC with its gate connected to an output of said second transistor and supplying an output to a first input lead of said fan motor, a third transistor connected to a third output of said counter, and a second TRIAC with its gate connected to an output of said third transistor and supplying an output to a second input lead of said fan motor.

4,371,815

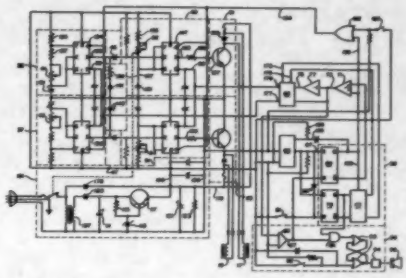
WATERBED VIBRATOR

Johnny O. Jones, Jr., No. 1 Cross Creek, Irvine, Calif. 92714, and Charles C. White, Jr., 8952 Sailport Dr., Huntington Beach, Calif. 92646

Division of Ser. No. 800,588, May 25, 1977. This application Mar. 31, 1980, Ser. No. 136,176

Int. Cl.³ H02K *33/00*

U.S. Cl. 318—114 **2 Claims**



1. A vibrator for furniture, comprising.

a pair of transducers for producing mechanical vibration, said transducers mounted at spaced locations on said furniture;

means for producing an electrical driving signal for driving said pair of transducers at different vibration frequencies; and

signal means responsive to said driving signal producing means for indicating the difference frequency between said different vibration frequencies, said signal means comprising a light connected to said driving signal producing means and pulsating at said difference frequency.

4,371,816

CONTROL CIRCUIT FOR AN ULTRASONIC DENTAL SCALER

Alfred Wieser, Usingerstrasse 33, 6391 Usingen 2, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,886

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1975, 2559198; Jan. 12, 1976, 2600877

Int. Cl.³ H01V *9/00*

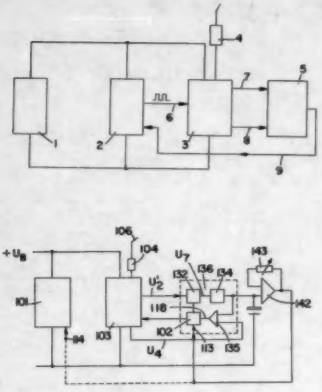
U.S. Cl. 318—116 **6 Claims**

1. In a control circuit for an ultrasonic dental scaler including: a work tool; a transducer connected to said work tool for imparting vibratory motion thereto and forming a vibratory system therewith having a resonant frequency, said resonant frequency varying in response to variation of the contact pressure of said work tool against a tooth; an oscillator for driving said transducer; and said control circuit connected to said transducer and said oscillator for continuously readjusting the frequency of said oscillator to substantially the instantaneous resonant frequency of said vibrating system to thereby maintain substantially constant power output from said transducer, the improvement comprising:

(a) sensing means connected to said control circuit for sensing a measured value indicative of the contact pressure of said work tool against said tooth; and

(b) said sensing means being operative to reduce the output

power of said transducer when a selected maximum contact pressure of said work tool against said tooth is



exceeded by effecting in the frequency of said oscillator a change from said instantaneous resonant frequency.

4,371,817

BRUSHLESS, PERMANENT MAGNET D-C PULSE CURRENT CONTROLLED, ESSENTIALLY UNIFORM TORQUE DYNAMO ELECTRIC MACHINE, PARTICULARLY MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

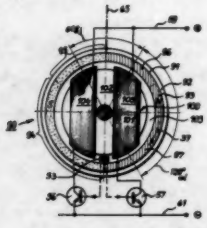
Continuation of Ser. No. 127,641, Mar. 6, 1980, abandoned, which is a division of Ser. No. 919,702, Jun. 27, 1978, Pat. No. 4,211,963. This application Dec. 3, 1980, Ser. No. 212,502

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730142

The portion of the term of this patent subsequent to Jul. 8, 1999, has been disclaimed.

Int. Cl.³ H02P *7/36*

U.S. Cl. 318—254 **35 Claims**



1. Brushless d-c motor comprising

a stator support;

a permanent magnet rotor having first and second essentially annular magnetic regions,

wherein the first region defines n poles of alternating polarity, and the second region defines 2n poles of alternating polarity,

wherein n is an even number;

magnetically-actuable rotor position sensing means (53) supported on the stator support and arranged to be magnetically actuated by the first magnetic region to provide, as a consequence of said actuation, rotor position information, including information relating to the position of one of said magnetic regions of the rotor to the sensing means;

stator pole means located on said stator support and positioned for electromagnetic coupling and interaction with the rotor, including two winding means,

wherein the stator pole means extends over at least a part of the first and second magnetic regions of the rotor and has an angular extent, in the direction of rotation, over both the first and second regions of approximately two-thirds, or integral multiples thereof, of one pole pitch of the first magnetic region;

and controlled switching means, selectively connecting a selected one of said winding means to a source of electrical power in dependence on said rotor position information to provide, in operation, controlled current flow through the selected one of the windings for effecting electromagnetic interaction with the magnetic regions of the rotor.

4,371,818

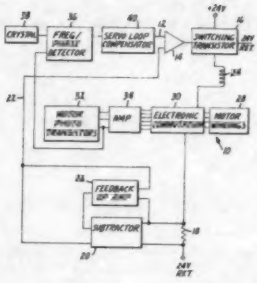
SPINDLE MOTOR CONTROL SYSTEM

Martyn A. Lewis, Pacific Palisades, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 15, 1980, Ser. No. 197,185

Int. Cl.³ H02P *1/02*

U.S. Cl. 318—313 **29 Claims**



1. A motor control system for controlling an electric motor of the type having a rotor and a plurality of windings, having electronic commutation for said plurality of windings, and having a linear speed control feedback loop for said windings utilizing a velocity feedback sensor comprising:

a current sensor coupled to said plurality of said windings for producing a current feedback signal indicative of the amount of the current flowing through said electric motor;

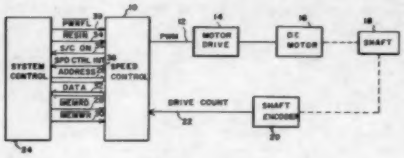
a comparator coupled in said linear speed control feedback loop and coupled to said current feedback signal of said current sensor for providing a comparison output responsive to the result of a comparison between said linear speed control feedback loop and said current feedback signal, said comparison output indicative of the error in the desired position of said rotor in said electric motor and of said current feedback signals;

a transistor circuit coupled to said comparison output, said transistor circuit providing linear closed loop speed control feedback to said electronic commutation when said current feedback signal does not exceed a predetermined value and said switching transistor providing an oscillating pulse width modulation control of said electronic commutation when said current feedback signal exceeds said predetermined value.

4,371,819
PULSE WIDTH MODULATION SPEED CONTROL

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Dec. 11, 1980, Ser. No. 215,441
Int. Cl.³ H02P 5/06
U.S. Cl. 318—341 **5 Claims**



1. A drive system comprising:

a DC electric motor;

a drive shaft driven by the DC electric motor;

encoder means for providing encoder pulses in response to incremental rotation of the drive shaft;

means for sensing time periods between selected encoder pulses and providing first digital values representative of the sensed time periods;

means for storing a second digital value representative of a desired time period corresponding to a desired speed;

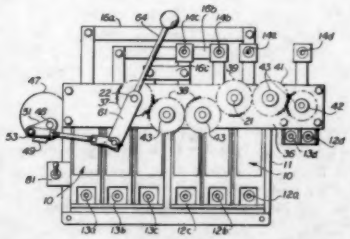
means for comparing sensed and desired time periods and providing a third digital value which is a function of the comparison of the sensed and desired time periods; wherein the means for comparing compares the second digital value representative of the desired time period with an average of a plurality of first digital values representative of consecutive sensed time periods; and wherein the means for comparing compares the plurality of first digital values representative of consecutive sensed time periods with one another and permits a change in the third digital value only if the first digital values representative of consecutive sensed time periods are within a predetermined range of one another; and

means for energizing the DC electric motor for a time interval which is a function of the third digital value.

4,371,820
ROTARY LINE TRANSFER SWITCH

Johann Kruger, San Carlos, Calif., assignor to Electro-Motion, Inc., Redwood City, Calif.

Filed Aug. 17, 1981, Ser. No. 293,347
Int. Cl.³ G05B 5/00
U.S. Cl. 318—468 **6 Claims**

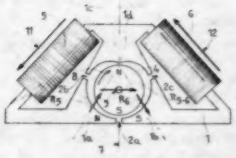


1. An oscillatory line transfer switch comprising a first oscillatory switch having a first casing and a first shaft extending externally of a first end of said first casing, a second oscillatory switch having a second casing and a second shaft extending externally of a first end of said second casing, a frame securing said casings together in side-by-side position, first means external of said casings for turning said first and second shafts together, at least two separate normal power input terminals for said first switch, at least two emergency power input terminals for said second switch, each said switch having at least two power output terminals, the corresponding power output terminals of said two switches being electrically connected together, second means sensing decline in voltage at said normal power input terminals below a pre-selected voltage, third means sensing frequency at said emergency power input terminals above a pre-selected frequency, a motor, a third shaft driven by said motor, fourth means for energizing said motor for rotation of said third shaft through one cycle of rotation upon energization of either said second or third means and fifth means mechanically connecting said third shaft to first shaft to oscillate said first and second shafts, said fifth means including a first crank fixed to said third shaft, an arm loose on said third shaft positioned to be turned by said first crank as said third shaft turns, a connecting rod, a pin pivotally connecting a first end of said connecting rod to said arm, a second crank fixed to said first shaft, the second end of said connecting rod being pivotally connected to said second crank, and manual means for oscillating said one of said first and second shafts independently of rotation of said third shaft.

4,371,821
ELECTROMAGNETIC MOTOR ROTATABLE IN EITHER DIRECTION

Claude Laesser, La Chaux-de-Fonds; Roberto Zafferri, Lugano, and Jean Depery, Neuchtel, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Jul. 3, 1980, Ser. No. 165,563
Int. Cl.³ G05B 19/40
U.S. Cl. 318—696 **17 Claims**



1. A bidirectional stepping motor comprising:

a rotor constituted by a permanent magnet mounted for rotation about an axis and providing a permanent magnetic field;

a stator including two and only two electrical coils, an armature including three and only three pole faces, said pole faces consisting of first, second and third pole faces arranged around said rotor, means for providing a first magnetic path connecting the first pole face to the second pole face and for mounting one of said two coils, and means for providing a second magnetic path connecting the first pole face to the third pole face and for mounting the other of said two coils; and

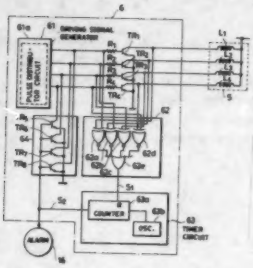
means for applying electrical pulses independently to each coil while controlling the polarity of said pulses, the polarity of said pulse determining the sense of the magnetic fields for reversibly controlling said rotor.

4,371,822

CONTROL DEVICE FOR PULSE MOTORS, HAVING A FAIL SAFE FUNCTION

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,015
Claims priority, application Japan, Aug. 29, 1980, 55-120144
Int. Cl.³ H02K 29/04
U.S. Cl. 318—696 8 Claims



1. A control device for driving a pulse motor having a stator and a plurality of stator coils wound on said stator in a polyphase arrangement, said control device comprising:

a driving circuit comprising:

generator means having a plurality of output terminals and adapted to generate driving pulses at said output terminals in a predetermined sequence, and

a plurality of power transistors, each having (i) an input terminal coupled to a corresponding one of said output terminals of said generator means, and (ii) an output terminal at which the power transistor is adapted to generate an output signal having a level which is in a predetermined relationship with the level of an input signal applied to the input terminal thereof,

the output terminal of each power transistor being coupled to a corresponding one of said stator coils of said pulse motor,

said power transistors being sequentially energized by said driving pulses generated by said generator means in said predetermined sequence to sequentially energize said stator coils;

an abnormality detecting circuit for (i) comparing the level of the input signal applied to the input terminal of each of said power transistors with the level of the output signal at the output terminal thereof and (ii) generating a malfunction indicating signal when said two levels are out of said predetermined relationship; and

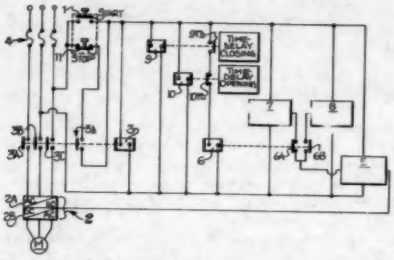
a timer circuit coupled to said abnormality detecting circuit for generating a warning signal when said malfunction indicating signal is continuously generated over a predetermined period of time.

4,371,823

APPARATUS AND METHOD FOR STARTING TEXTILE WINDER SYNCHRONOUS MOTOR DRIVES

Hans Lobest, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation of Ser. No. 20,539, Mar. 14, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,966
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811123
Int. Cl.³ H02P 1/04
U.S. Cl. 318—705 11 Claims



1. A method for accelerating a synchronous motor for standstill to rated synchronous running speed, comprising:

coupling a synchronous motor to a variable frequency source of alternating current;

accelerating said motor asynchronously to a first predetermined intermediate speed lower than rated running speed by increasing the frequency of said current according to a first predetermined function; then

decelerating said motor to a second predetermined intermediate speed lower than said first intermediate speed by decreasing the frequency of said current according to a second predetermined function, thereby synchronizing said motor at said second intermediate speed; and then

accelerating said motor synchronously from said second intermediate speed to the rated running speed by increasing the frequency of said current according to a gradual third predetermined function; while thereby maintaining the magnitude of the current drawn by the motor from said source at levels not exceeding a predetermined amount.

4,371,824

BASE DRIVE AND OVERLAP PROTECTION CIRCUIT

David J. Gritter, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 5, 1979, Ser. No. 55,139
Int. Cl.³ H02P 7/58
U.S. Cl. 318—722 30 Claims

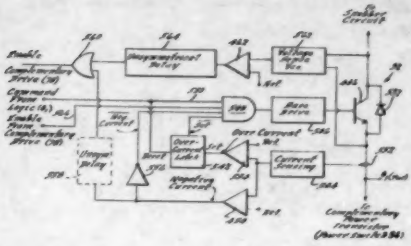
1. A base drive and overlap protection circuit comprising:

power switching means;

means operative to monitor current flow through said power switching means and to generate a negative current signal as a function thereof; and

gating means operative to receive said negative current signal, switch command signals from a control circuit and an enable

signal from an enabling circuit, and to generate a switching signal in response thereto, said power switching means being



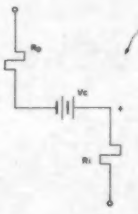
operative to switch from a first state to a second state in response to said switching signal.

4,371,825

METHOD OF MINIMIZING THE EFFECTS OF PARASITIC CURRENTS

Michael C. Chi, Cerritos, Calif., and Peter Carr, Utica, Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jun. 4, 1981, Ser. No. 270,481
Int. Cl.³ H01M 10/44
U.S. Cl. 320—5 **24 Claims**



1. A method of minimizing cell imbalances due to parasitic currents in a secondary electrochemical energy storage device having a plurality of cells formed in two groups with said cells in each of said groups connected electrically in series, and a common electrolyte in communication with each of said cells in said groups of cells, comprising the steps of:

charging said energy storage device with said groups of cells connected electrically in series; and

discharging said energy storage device with said groups of cells reconnected electrically in series in an inverted sequence.

4,371,826

NON-DISSIPATIVE BATTERY CHARGE CIRCUIT

Randolph D. W. Shelly, Rosemere, Canada, assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,768
Int. Cl.³ H02J 7/04
U.S. Cl. 320—21 **9 Claims**

1. A battery charging system for charging a battery from an unregulated voltage source by delivering fixed maximum amplitude pulse width modulated constant current charging signals comprising:

input means for coupling to a source of charging voltage;

battery voltage level determining means for determining when the battery is fully charged and for providing a charge disabling signal when the battery is fully charged;

charging current switch means coupled to said input means, and including control means, said charging current switch means for causing conducting of charging current when said control means is activated;

charging current sensing means coupled to said charging current switch means for sensing the levels of said charging current and for providing current level indicating signals in response to said levels;

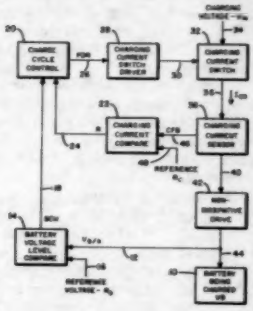
charging current comparison means coupled to said charging current sensing means for comparing said charging current to a predetermined reference for providing reset signals when a predetermined current level comparison is sensed;

non-dissipative impedance means coupled to said charging current sensing means for providing said charging current to the battery being charged;

charge cycle control means coupled to said battery voltage level determining means and said charging current comparison means for sequentially providing activating signals for successive charge cycles until said battery voltage level determining means indicates the battery is fully charged, wherein said charge cycle control means includes

clock means for providing clocking signals at a predetermined frequency;

flip-flop means having output means for providing signals indicative of its state, set input means coupled to said clock means for causing said flip-flop means to exhibit a first state in response to said clocking signals, and reset input means coupled to said charging current comparison means for



causing said flip-flop means to exhibit a second state in response to said reset signals;

logic means responsively coupled to said battery voltage level determining means, said clock means, and said flip-flop means for providing said activating signals to said charging current switch driver means for controlling activation of said charging current switch means to provide said charging current; and

wherein said logic means includes

gating means for controlling termination of the charging of the battery, said gating means having first gate input means coupled to said battery voltage level determining means, second gate input means, and-gate output means for providing a disabling signal when the battery is fully charged;

enabling means for controlling activation of said charging current switch driver means, said enabling means having first enable input means coupled to said gate output means, second enable input means coupled to said clock means, third enable input means coupled to said flip-flop means, and enable output means coupled to said second gate input means and to said current switch driver means for providing said activating signals to said charging current switch driver means when signals received on said first, second and third enable input means have a predetermined relationship; and

charging current switch driver means coupled intermediate said charge cycle control means and said charging current switch means for providing drive signals for activating said control means and causing said charging current switch

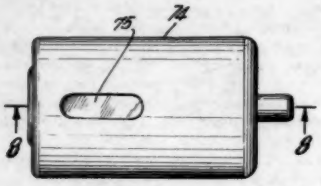
means to provide charging current in response to each of said activating signals.

4,371,827

BATTERY CHARGER WITH INDICATOR FOR INDICATING FULL CHARGE OF SECONDARY CELLS OR BATTERY THEREOF

Ferdinand H. Mullersman, and Clifford L. Scholefield, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Aug. 22, 1980, Ser. No. 180,196
Int. Cl.³ H02J *7/00*; G01K *11/12*
U.S. Cl. 320—48 **7 Claims**



1. An improved battery charger having a housing and electrical contact means for coupling a charging power supply to cells or batteries to be charged, wherein the improvement comprises a full charge indicator mounted to the housing adjacent each charge location in the housing for indicating when a cell or battery in the adjacent charge location has reached essentially full charge, each said indicator comprising heat sensitive means adapted to display a change in some perceivable characteristic when subjected to a rise in temperature, a first element of said heat sensitive means being thermally coupled to the battery or cell so that said element is maintained at substantially the same temperature as the battery or cell, and a second element of said heat sensitive means being thermally isolated from the battery or cell so that it remains substantially at ambient temperature; such that once the battery or cell has reached essentially full charge, further charging causes said first element to undergo a change in said perceivable characteristic as a result of the change in temperature of the battery or cell, while the perceivable characteristic of said second element remains essentially unchanged, with the relative difference in the perceivable characteristic of the two elements being observable.

4,371,828

AUTONOMOUS ELECTRICAL POWER GENERATOR

Giovanni Tornatore, San Benigno Canavese, and Lorenzo Bogetti, Piobesi Torinese, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 28, 1981, Ser. No. 257,843
Claims priority, application Italy, May 5, 1980, 67698 A/80
Int. Cl.³ H02K *11/00*; H02P *9/04*
U.S. Cl. 322—32 **5 Claims**

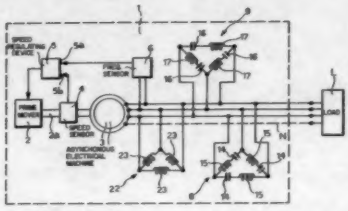
1. An autonomous electrical power generator comprising

a prime mover,

a three-phase asynchronous electrical machine coupled to said prime mover and acting, in use, as a generator,

at least one set of three delta-connected capacitors, the vertices of this delta-connection each being connected to a respective phase of the said electrical machine; the capacitance values of said capacitors being such that, in operation, the said capacitors constitute together with the said windings of the electrical machine, three circuits resonating at a frequency corresponding to the speed of rotation of the machine,

respective inductors connected in series with the capacitors of the said at least one set of capacitors so as to form therewith at least one set of three L-C series resonators; the inductance values of said inductors being such that the resonant frequency of the resonators of each of the said at least one set of resonators is substantially equal to a corresponding predetermined odd harmonic of the frequency of the voltage supplied, in use, by the said electrical machine, and,



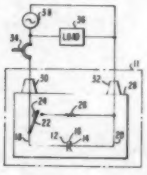
a set of three delta-connected saturable reactors, the vertices of this delta-connection each being connected to a respective phase of said electrical machine.

4,371,829

CAPACITOR UNIT WITH A DISCHARGE RESISTOR SWITCH

Seymour Salowe, Murrysville, and Thomas C. Zinchuk, Level Green, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1981, Ser. No. 321,159
Int. Cl.³ H02J *3/18*
U.S. Cl. 323—209 **10 Claims**



1. A capacitor unit comprising:

two capacitor electrodes separated by dielectric material;

two conductive leads each electrically connected to one of said capacitor electrodes;

a branch circuit connected between said conductive leads;

said branch circuit including a resistor and a switch in series with said resistor; and

said switch including means responsive to power frequency current flowing in the conductive leads for opening said circuit branch when power frequency current is flowing in the capacitor unit, and for maintaining said circuit branch closed when power frequency current is not flowing in the capacitor unit to discharge residual charge from said capacitor electrodes.

4,371,830

HIGH VOLTAGE CHARGE-REGULATING POWER SUPPLY FOR A PULSED LOAD

Richard S. Loucks, Northridge, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 21, 1981, Ser. No. 265,958
Int. Cl.³ G05F *1/44*
U.S. Cl. 323—265 **8 Claims**

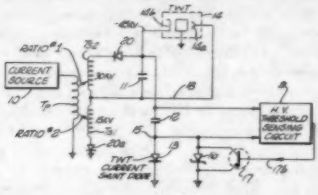
1. A high voltage dc power supply for a load which draws current during recurrent pulse times and substantially no current between pulses, comprising:

a first capacitor, a source of current at high voltage and a first

diode connected between said capacitor and said source to provide charging of said capacitor;

a ground potential return circuit between said source and said first capacitor and a second diode connected in series in said return circuit, said second diode being polarized so as to pass current during discharge but not during charging of said capacitor, the grounded terminal of said second diode and the junction of said first diode and said capacitor providing the terminals for connecting said load;

a high voltage threshold sensing circuit connected to measure



the voltage across said capacitor and to generate a switching signal in a first condition when said capacitor charges to a predetermined voltage and in a second condition whenever said capacitor voltage has an absolute value less than said predetermined voltage; and

control means responsive to said switching signal and connected in parallel with said second diode for clamping the junction of said capacitor and said second diode to ground during said switching signal second condition and for providing a voltage pedestal at said capacitor and second diode junction during said first switching signal condition.

4,371,831

MONITORING DEVICE FOR DISTINGUISHING THE OPERATING STATE OF A LOAD

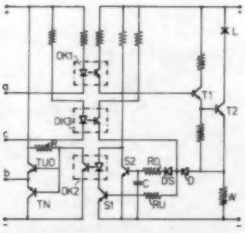
Rainer Boschulte; Heinrich Koehnecke, and Siegfried Muecke, all of Brunswick, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,483

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1979, 2952462

Int. Cl.³ G05F *1/00*

U.S. Cl. 323—284 **3 Claims**



1. A device for checking at least a first threshold switch in a monitoring device for distinguishing the operating states of a load, comprising:

said first threshold switch;

a second threshold switch connected to said first threshold switch and operable in response to a control potential above a predetermined maximum value to drive said first threshold switch into a first state, said first threshold switch operable in response to a control potential above a predetermined minimum value to switch from the first state to a second state;

a precision resistor connected in series with the load for providing a control potential representing the current through the load, said precision resistor connected to control said second threshold switch; and

check means including a check signal input for receiving a check signal, said check means connected to said load, said precision resistor and said second threshold switch and operable in response to a control potential above a predetermined maximum value to operate said second threshold switch in response to receipt of a check signal and a control potential above a predetermined minimum value.

4,371,832

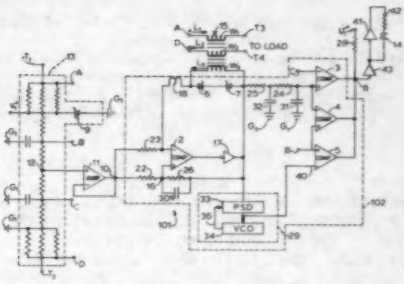
DC GROUND FAULT DETECTOR WHEREIN FAULT IS SENSED BY NOTING IMBALANCE OF MAGNETIC FLUX IN A MAGNETIC CORE

Gerald L. Wilson, 29 Highgate Rd., Wayland, Mass. 01778, and David Otten, 50 Playstead Rd., Newton, Mass. 02158

Filed May 27, 1980, Ser. No. 153,710

Int. Cl.³ G01R *31/02, 19/10, 33/00*

U.S. Cl. 324—51 **24 Claims**



1. A dc ground fault detector that comprises a high permeability toroidal core having a square hysteresis loop; three windings wound about the toroid in a solenoidal configuration, two of the windings having an equal number of turns; means for introducing an electric current into one of the two windings, which current, in a normally operating detector, flows through to a load whose ground condition is to be sensed and then to the other of the two windings, the current in one of the two windings being caused to flow in a direction that produces a magnetomotive force opposite to the direction of the magnetomotive force of the other winding of the two windings; sensing means operable to determine any difference between the currents in the two windings, which difference drives the core into saturation, said sensing means comprising a voltage source and series resistor connected across the third of the three windings, said sensing means further including means to reverse the polarity of the voltage applied by the voltage source every time current through the third winding reaches a predetermined value, there being an increase in the frequency of the voltage as the core becomes more saturated; and measuring means connected to the voltage surce and operable to measure the frequency of the voltage applied to the third winding and operable to relate the frequency to the presence or absence of ground fault.

4,371,833

SPEED SWITCH

William J. Roberts, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Jun. 11, 1980, Ser. No. 158,658

Int. Cl.³ G01P *3/56*

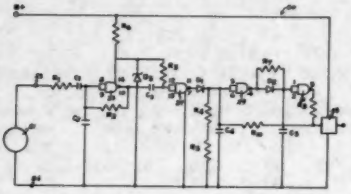
U.S. Cl. 324—161 **16 Claims**

1. A speed limiting indicating device for an internal combustion engine having:

(a) an engine speed sensor providing a first signal indicative of engine speed;

(b) means responsive to said first signal for providing a speed limit signal indicative of said engine speed exceeding a predetermined speed limit;

(c) said speed limit signal means including logic gate means having its input connected to said first terminal for providing said speed limit signal at said predetermined limit speed;



said logic gate means including at least first and second gates and first and second timing circuits;

said first gate having its input connected to said first signal and to said first timing circuit and a second gate having its input connected to said second timing circuit and the input of said first gate and providing said speed limit signal at its output.

4,371,834

DEVICE FOR MEASURING THE FREQUENCY OF AN ELECTRICAL CURRENT REPRESENTATIVE OF A VARIABLE QUANTITY

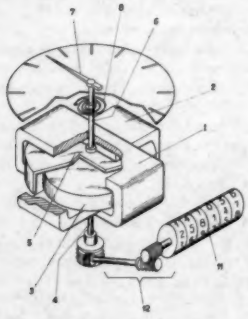
Jean-Jacques Bezard, La Garenne Colombes, and Bernard A. Delevallee, Argenteuil, both of France, assignors to Jaeger, Levallois-Perret, France

Filed May 18, 1981, Ser. No. 264,396

Claims priority, application France, May 14, 1980, 80 10911

Int. Cl.³ G01P *3/48, 3/54*

U.S. Cl. 324—167 **8 Claims**



1. A device responsive to a variable quantity, comprising:

means sensitive to said variable quantity for producing and transmitting a signal composed of pulses having a frequency proportional to said variable quantity;

a permanent magnet integral with a first spindle, said first spindle having an axis of rotation, said magnet being arranged transversely with respect to said axis of the first spindle and mounted to rotate freely about the axis of said first spindle;

a cup-shaped rotor of conducting material disposed in the vicinity of and covering said permanent magnet, said rotor being integral with a second spindle, said second spindle having an axis which is aligned with the axis of the first spindle, said rotor being mounted to pivot about the axis of said second spindle;

a return spring acting upon said second spindle and mounted to exert a torque opposing the rotation of the rotor;

an indicator needle supported by said second spindle transversely to its axis for indicating the position of the rotor;

at least two coils offset angularly to each other and surrounding said permanent magnet and said cup-shaped rotor; and

a receiver device which receives said pulses and supplies said two coils with square wave signals produced from said pulses in order to produce a transverse magnetic field with respect to the axis of the first spindle, said transverse magnetic field having a rotary nature about said axis of the first spindle, so as to produce a rotation of said permanent magnet at a speed proportional to said variable quantity, whereby the cup-shaped rotor is subjected to a driving torque due to the production of eddy currents generated when the permanent magnet rotates and to an opposing torque due to the return spring, the cup-shaped rotor being immobilized in a predetermined position representative of said variable quantity when the opposing torque equals said driving torque.

4,371,835

RPM DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

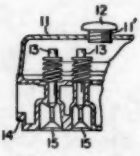
Yoshiyuki Kago; Sigeyuki Akita, both of Okazaki, and Katsuhisa Fujikawa, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 29, 1980, Ser. No. 191,682

Claims priority, application Japan, Oct. 2, 1979, 54-136884[U]

Int. Cl.³ G01P *3/48*

U.S. Cl. 324—174 **8 Claims**



1. In an internal combustion engine having a cylinder head cover provided with an oil inlet and a valve drive mechanism disposed within said cylinder head cover, an rpm detection system for detecting the number of revolutions of the engine, comprising:

a pre-magnetized valve operating member constituting a component element of said valve drive mechanism and located in the neighborhood of said oil inlet;

a magnetic sensor removably mounted in said oil inlet for detecting the changes of the magnetic field in said magnetized valve operating member accompanying the motion thereof; and

a processing circuit means for converting the detection signal from said magnetic sensor into a pulse signal having a frequency proportional to the engine rpm.

4,371,836

DEVICE FOR MEASURING THE LOCATION, ATTITUDE AND/OR CHANGE OF LOCATION OR, RESPECTIVELY ATTITUDE OF A RIGID BODY IN SPACE UTILIZING TWO SETS OF FOUR PARALLEL ANTENNAS FOR CONCENTRATING THE FIELD LINES

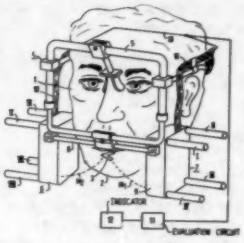
Bernd Nickel, Lorsch, and Wolfgang Schorr, Lautertal, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,146

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852764

Int. Cl.³ G01B 7/14; A61B 5/10

U.S. Cl. 324—207 9 Claims



1. A measuring device for operative association with a rigid body for sensing movement thereof in space, said measuring device comprising a field generator attached to said body for generating a defined irregular field, pickups having field-flux-dependent sensor elements for sensing movement of the field generator relative thereto when the field generator and pick-ups are mounted for relative movement in accordance with the movement of a rigid body in space during a measurement operation, and an electronic circuit connected to the pickups for obtaining and evaluating electric signals arising from movement of the field generator relative to the field-flux-dependent sensor elements, the sensor elements (13) of the pickups (I through VIII) having respective elongated antennae (14, 15) concentrating the field lines at the respective sensor elements and having respective ends closest to the field generator (3) forming eight corner points (A through H) of a cuboid (25) with the field generator (3) arranged within the space determined by the eight corner points (A through H) of the cuboid, the sensor elements (13) having respective effective surfaces (24) which are perpendicular to the longitudinal axes of the respective elongated antennae (14, 15), said antennae being arranged in two sets of four elongated antennae, each set of four elongated antennae being arranged with the antennae thereof parallel to one another and the two sets arranged at respective opposite sides of the field generator (3).

4,371,837

TEMPERATURE COMPENSATED INPUT POWER AND OUTPUT OFFSET CIRCUITS FOR A HALL EFFECT TRANSDUCER

Walter J. Sieverin, McHenry, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 13, 1979, Ser. No. 93,885

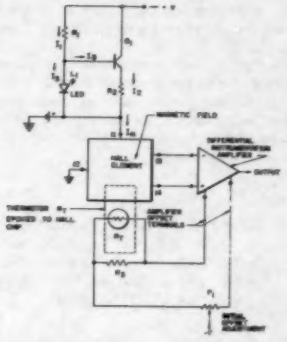
Int. Cl.³ G01R 33/06; G01N 27/72; H03K 17/90, 19/08

U.S. Cl. 324—225 5 Claims

1. A temperature and offset voltage compensating circuit for a Hall effect transducer comprising:

a supply circuit means connected between a power source and the power supply input of a Hall effect transducer including a constant current source and a load responsive voltage reference source for adjusting the overall current available to said transducer in accordance with changes in gain and input power resistance as a result of temperature change while being responsive to small changes in magnetic field, where said supply circuit means being responsive to resistance changes of said transducer as a function of temperature to vary and adjust input power to said transducer in accordance with changes in resistance thereof and to prevent any changes in signal output gain due to transducer resistance fluctuations; and

an output circuit means connected to the output of said Hall effect transducer and having a temperature responsive thermistor as part of a control system for feeding a differential amplifier in said system and connected to the output of said transducer and a thermistor adjacent said transducer in circuit with an adjustable resistance for zeroing the initial offset of said transducer and linearizing the signal of said thermistor to provide a controlling input from said thermistor to said amplifier for correcting said Hall effect output in accordance with ambient temperature changes at said transducer.



4,371,838

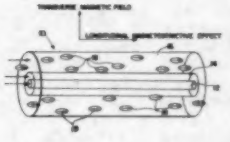
OPTICAL FIBER WAVEGUIDE FOR MEASURING MAGNETIC FIELDS

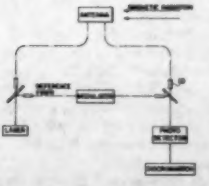
David L. Griscom, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1980, Ser. No. 190,298

Int. Cl.³ G01R 33/00

U.S. Cl. 324—244 17 Claims





1. An optical fiber waveguide for use in the detection of a

magnetic field or magnetic radiation accompanying an electromagnetic signal comprising:

an optical fiber waveguide including numerous discrete elongate single-domain magnetized particles;

said particles having their longitudinal axes and magnetization vectors disposed generally parallel with the longitudinal axis of the waveguide;

a laser with its beam directed into one end of said waveguide;

interferometric means for sensing phase shifts in the light of said laser passing through said waveguide; and

means for subjecting said waveguide to a tranverse magnetic field;

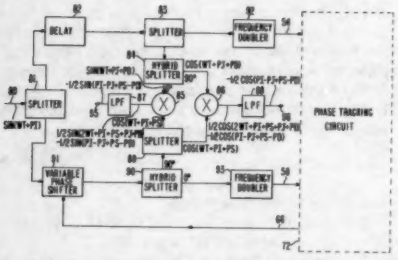
whereby, said transverse magnetic field causes the elongate particles to undergo linear dimension change due to the magnetostrictive effect and to cause linear dimension changes in the optical fiber waveguide so that a laser beam light passing therethrough undergoes phase shifts detectable with interferometry.

4,371,839

DIFFERENTIALLY COHERENT SIGNAL DETECTOR

Michael D. Rubin, Saratoga, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Apr. 3, 1980, Ser. No. 136,866
Int. Cl.³ H04L *27/22*
U.S. Cl. 329—104 **1 Claim**



1. A differentially coherent signal detector comprising:

a first splitter having as an input the signals to be demodulated;

a delay means having an input connected to a first output of the first splitter;

a second splitter having an input connected to an output of the delay means;

a variable phase shifter having a first input connected to a second output of the first splitter;

a third splitter having an input connected to an output of the variable phase shifter;

a first mixer having a first input connected to a first output of the second splitter and having a second input connected to a quadrature output of the third splitter;

a first low pass filter having an input connected to an output of the first mixer and having as an output the demodulated signals;

a fourth splitter having an input connected to a second output of the second splitter;

a fifth splitter having an input connected to an inphase output of the third splitter;

a second mixer having a first input connected to a first output of the fourth splitter and having a second input connected to a quadrature output of the fifth splitter;

a third mixer having a first input connected to a second output of the fourth splitter and having a second input connected to an inphase output of the fifth splitter;

a second low pass filter having an input connected to an output of the second mixer;

a third low pass filter having an input connected to an output of the third mixer;

a multiplier having a first input connected to an output of the second low pass filter and having a second input connected to an output of the third low pass filter;

a conditioning amplifier having an input connected to an output of the multiplier and having an output connected to a second input of the variable phase shifter;

a sixth splitter connected between said second splitter and said first mixer;

a seventh splitter connected between said third splitter and said first mixer;

a fourth mixer connected between said sixth splitter and said seventh splitter;

a fourth low pass filter connected to said fourth mixer;

a first frequency doubler connected between said second splitter and said fourth splitter; and

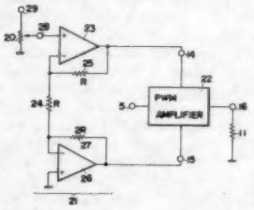
a second frequency doubler connected between said third splitter and said fifth splitter.

4,371,840

GAIN CONTROL CIRCUIT FOR PULSE WIDTH MODULATION AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 14, 1980, Ser. No. 168,726
Claims priority, application Japan, Aug. 8, 1979, 54-109327
Int. Cl.³ H03F *3/38*
U.S. Cl. 330—10 **8 Claims**



1. In a gain control circuit for a pulse width modulation amplifier comprising a pulse width modulation circuit which modulates a carrier signal by an input signal applied to said pulse width modulation amplifier to make a pulse width modulated signal, a pulse amplification circuit for amplifying said pulse width modulated signal to generate an amplified pulse width modulated signal, said pulse amplification circuit having two power supply terminals and said amplified pulse width modulated signal having an amplitude of a same value as a value of the voltage supplied to said two power supply terminals, and a low-pass filter circuit adapted for use in obtaining an output signal having the same waveform as said input signal from said amplified pulse width modulated signal, said gain control circuit comprising,

variable voltage supplying means capable of supplying a variable voltage to said two power supply terminals of said pulse amplification circuit, said amplitude of said amplified pulse width modulated signal being varied by varying the voltage supplied to said two power supply terminals of said pulse amplification circuit, so that an amplitude of said output signal derived from said low-pass filter circuit being varied, whereby the gain of the pulse width modulation amplifier is controlled in accordance with the supply voltage applied to the pulse amplification circuit.

4,371,841

CIRCUIT ARRANGEMENT FOR ELIMINATING TURN-ON AND TURN-OFF CLICKS IN AN AMPLIFIER

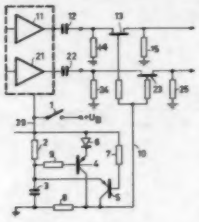
Wolfgang Eckert, Reinfeld; Bernd Holtkamp, and Ernst A. Kilian, both of Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1980, Ser. No. 171,691

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931144

Int. Cl.³ H03F *1/14*

U.S. Cl. 330—51 **7 Claims**



1. A circuit arrangement for eliminating turn-on and turn-off clicks in an amplifier comprising:

an amplifier,

a controllable switching device for interrupting the signal path of said amplifier included in the signal path after said amplifier,

a supply voltage,

a series connection of a capacitor and a resistor said supply voltage connected to said amplifier through said capacitor and resistor,

two transistors the base-emitters of said transistors being connected in parallel with said resistor, a first one of said transistors being arranged such that it is turned on by the voltage drop produced across said resistor by the charging current of said capacitor and the second transistor being arranged such, that it is turned on by the voltage drop produced across said resistor by the discharge current of said capacitor, and the collector currents of said transistors serving to control said switching device.

4,371,842

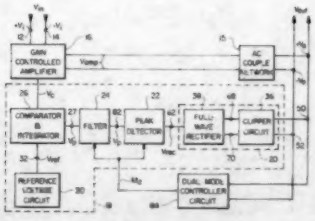
SELF-ADJUSTING DUAL MODE AUTOMATIC GAIN CONTROL CIRCUIT

Patrick S. Lee, Campbell, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 24, 1980, Ser. No. 200,364

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—141 **7 Claims**



1. A dual mode automatic gain control circuit for generating control signals to a gain controlled amplifier for producing substantially constant amplitude pulse-type output data signals from said amplifier from variable amplitude pulse-type input data signals subjected to having relatively long data gaps therein, said automatic gain control circuit including:

a voltage limiter coupled to the output of the gain controlled amplifier for clipping those output data signals having amplitudes above a predetermined level and for rectifying said output signals into D.C. signals of corresponding amplitudes;

peak detector circuitry coupled to said voltage limiter, said detector circuitry including a capacitor in parallel with discharge circuitry having component values that discharge said capacitor slower than the rate said capacitor is charged by said D.C. signals;

filter circuitry coupled to said peak detector;

comparator circuitry coupled to the output of said filter circuitry for comparing the output signal from said filter circuitry with a fixed reference voltage, and for generating the control signals for said gain controlled amplifier; and

mode controlling means within said automatic gain control circuit and coupled to said peak detector and to said filter circuitry, said mode controlling means responsive to the output data signals from said gain controlled amplifier for generating a first and a second mode signal to said peak detector circuitry and to said filter circuitry for altering component values in said circuitries, said first mode signal representing a fast mode for producing a control signal for a continuous train of pulse-type input data signals, said second mode signal representing a slow mode for producing control signals for gaps in said input data signals.

4,371,843

SEMICONDUCTOR DIFFERENTIAL AMPLIFIER CIRCUIT WITH FEEDBACK BIAS CONTROL

San-Chin Fang, New York, N.Y., and Donald L. Fraser, Jr., Warren Township, Somerset County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 7, 1980, Ser. No. 166,486

Int. Cl.³ H03F *3/45, 3/16*

U.S. Cl. 330—253 **13 Claims**

1. Semiconductor apparatus in MOS technology comprising a differential amplifier input stage (**10**) including a pair of substantially identical first and second mutually parallel branches (M_1M_3 and M_2M_4) having, respectively, first and second output nodes (N_1, N_2), said branches being connected through a common third node (N_3) to a controlled terminal of a common current-source transistor (M_5) for supplying current to both said branches, CHARACTERIZED IN THAT the first output node (N_1) of the first branch is directly connected to the gate electrode of a first auxiliary transistor (M_6) having one of its controlled terminals connected to a feedback node (N_F) which is connected both to the gate electrode of a first intermediate amplifier transistor (M_8) and to the gate electrode of said current-source transistor (M_5).

4,371,844
DIFFERENTIAL LOAD CIRCUIT EQUIPPED WITH FIELD-EFFECT TRANSISTORS

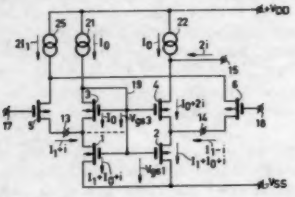
Wouter M. Boeke, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,652

Claims priority, application Netherlands, Feb. 25, 1980, 8001120

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—253 **16 Claims**



1. A differential load circuit equipped with field-effect transistors of the enhancement type comprises, first and second input terminals and a common terminal, a first and a second field-effect transistor of a first conductivity type having source electrodes connected to the common terminal, gate electrodes interconnected and drain electrodes connected to the first and second input terminals, respectively, a third and a fourth field effect transistor with interconnected gate electrodes, a first and a second current source circuit feeding quiescent currents to the third and the fourth transistor by connecting the drain electrodes of the third and the fourth transistor to the first and the second current source circuit, respectively, means connecting the source electrode of the third and the fourth transistor to the drain electrode of the first and the second transistor, respectively, and means connecting the gate electrodes of the third and fourth transistors to the gate electrodes of the first and the second transistor, at least one first output terminal connected to the drain electrode of the fourth transistor, and biasing means for biasing the gate electrodes of the first, second, third and fourth transistors to a potential such that the third and the fourth transistors carry the quiescent currents supplied by the current source circuits.

4,371,845
MODULAR MICROWAVE POWER DIVIDER-AMPLIFIER-COMBINER

Octavius Pitzalis, Jr., Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 152,470, May 23, 1980, abandoned. This application Jun. 15, 1981, Ser. No. 274,004

Int. Cl.³ H03F *3/16*; H01P *5/12*

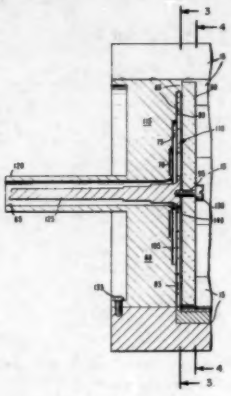
U.S. Cl. 330—277 **25 Claims**

1. A power divider/combiner comprising:

(a) a power input/output port having first and second ends and including one or more coaxial transmission line impedance transforming sections;

(b) a microwave energy radial divider/combiner section comprising a plurality of microwave energy transmission lines connected to and symmetrically radiating from the second end of the power input/output port to the outer edge of the divider/combiner section, each microwave transmission line comprising a microstrip conductor extending from the second end of the the power input/output port to the outer edge of the divider/combiner section; and

(c) means for transmitting microwave energy between the first end of the power input/output port and the ends of the transmission lines at the outer edge of the divider/combiner section, characterized in that the radial divider/combiner section includes an electrically conductive base surface, facing and fixably separated from the microstrip conductors, thereby forming a space between the microstrip conductors and the base surface, the space being filled with a dielectric medium, the distance of separation between the microstrip conductors and the base surface varying along the length of the transmission lines, such that an increasing impedance is attained from



the outer edge to the second end of the power input/output port, and that the value of this increasing impedance, in conjunction with the value of the coaxial impedance transforming sections, is used to optimally match the impedance at the first end of the power input/output port with that at the ends of the transmission lines at the outer edge of the divider/combiner section.

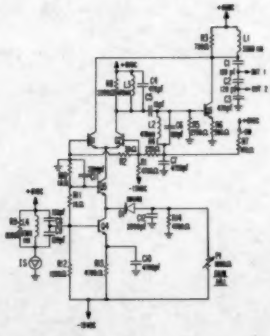
4,371,846
BANDWIDTH CONTROL CIRCUITRY FOR RADAR I-F AMPLIFIER

Edward B. Gamble, Granada Hills, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,825

Int. Cl.³ H03H *3/68*; H03G *3/30*

U.S. Cl. 330—278 **7 Claims**



1. In a radar receiver intermediate-frequency amplifier a bandwidth control circuit comprising:

first and second transistors, each having base and emitter and collector electrodes;

a node at which the emitter electrodes of said first and second transistors connect;

means for applying a reference potential to the base electrode of one of said first and second transistors;

means for selectively applying one of first and second quiescent potentials to the base electrode of the other of said first and second transistors, said first and second quiescent potentials being of opposite polarities to each other as referred to said reference potential, for selecting the conduction of said first transistor for obtaining relatively wideband operation or for selecting conduction of said second transistor for obtaining relatively narrowband operation;

means for applying a unidirectional current with signal variations to said node, said unidirectional current of a polarity for implementing conduction by the selected one of said first and second transistors;

narrow-bandwidth filter means for receiving the collector current of said second transistor to respond with a narrow-bandwidth signal;

amplifier means for supplying from an output circuit thereof an output current exhibiting variations applied to an input circuit thereof responsive to said narrow-band signal; and

wide-bandwidth filter means for receiving whichever of the collector current of said first transistor and the output current of said amplifier means is supplied, to respond with a bandwidth-controlled output signal.

4,371,847

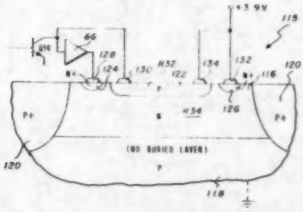
DATA TRANSMISSION LINK

James R. Biard, Richardson, and Ben R. Elmer, Plano, both of Tex., assignors to Spectronics, Inc., Richardson, Tex.

Division of Ser. No. 20,204, Mar. 13, 1979. This application Oct. 6, 1980, Ser. No. 194,124

Int. Cl.³ H03F *3/14*

U.S. Cl. 330—307 **3 Claims**



1. A method of altering the apparent electrical characteristics of a distributed electrical component in an integrated circuit, comprising in combination:

sinking the distributed electrical component into a second distributed electrical component which is substantially parallel to the distributed electrical component wherein the mutual distributed capacitance between the distributed electrical component and the parallel distributed electrical component is substantially greater than the distributed capacitance between the distributed electrical component and any other electrical component; and

driving the voltage across the parallel distributed electrical component by the voltage across the distributed electrical component by means of a follower circuit.

4,371,848

MAGNETRON HAVING A FILTER ON THE OUTPUT PROBE

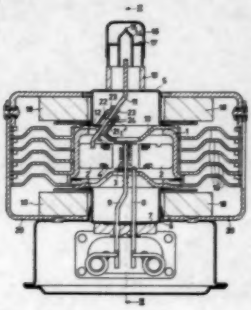
Egbert B. G. W. Gotje, and Franciscus N. A. Kerstens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,541

Claims priority, application Netherlands, Oct. 15, 1979, 7907593

Int. Cl.³ H01J *23/32*; H03B *9/10*

U.S. Cl. 331—91 **5 Claims**



1. A magnetron comprising:

(a) an anode housing having vanes extending internally from an inner wall of the housing;

(b) a cathode;

(c) an output portion; and

(d) a probe connected to at least one of the anode vanes and extending into the output portion,

said probe including a filter for attenuating a frequency other than the fundamental frequency of the magnetron,

said filter comprising at least one stub extending along one side of the probe and forming a slot having an effective length of approximately one quarter of the wavelength associated with frequency to be attenuated by the filter.

4,371,849

EVANESCENT-MODE MICROWAVE OSCILLATOR

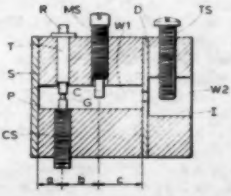
Stuart R. Longley, Limpsfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,346

Claims priority, application United Kingdom, Mar. 19, 1979, 7909487

Int. Cl.³ H03B *5/18*

U.S. Cl. 331—96 **9 Claims**



1. A microwave evanescent-mode oscillator comprising a length of rectangular waveguide having a cut-off frequency higher than the working frequency of the oscillator together with a Gunn element disposed within the waveguide characterised in that the oscillator comprises, spaced in sequence along the longitudinal axis of the waveguide, the Gunn element post-coupled into the waveguide and spaced from a first end of the waveguide, a capacitive member and at the opposite end of

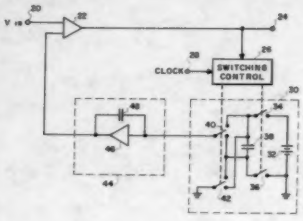
the waveguide an end wall perpendicular to said longitudinal axis having therein an output aperture for coupling out energy at said working frequency from the waveguide.

4,371,850

HIGH ACCURACY DELTA MODULATOR

Stefan H. Klement, White Plains, N.Y., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 12, 1980, Ser. No. 216,028
Int. Cl.³ H03K *13/22*
U.S. Cl. 332—11 D **10 Claims**



1. In a delta modulator having a comparator with a first and a second input terminal and an output terminal, an input signal applied to said first input terminal being compared with a quantized reference signal applied to said second input terminal to provide a digitized output signal on said output terminal, means for producing said quantized reference signal comprising:

a reference voltage source means;

a charge storage means selectively connected to said reference voltage source means to periodically charge said storage means;

a memory means;

means for periodically connecting said memory means to said charge storage means selectively in an additive or subtractive mode to algebraically sum the charge on said charge storage means with a charge on said memory means to provide said quantized reference signal at an output of said memory means;

control means connected between said output terminal of said comparator means and said charge storage means and said means for periodically connecting for operating said charge storage means and said means for periodically connecting in response to said digitized output signal; and

means connecting said output of said memory means to said second input terminal of said comparator.

4,371,851

RECEIVER PROTECTOR WITH MULTI-LEVEL STC ATTENUATION

Edward C. Niehenke, Elkridge; Gerald I. Klein, Baltimore, and Aldo E. Linsenbardt, Catonsville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1981, Ser. No. 258,094
Int. Cl.³ H01P *1/22*; G01S *13/00*
U.S. Cl. 333—17 L **16 Claims**

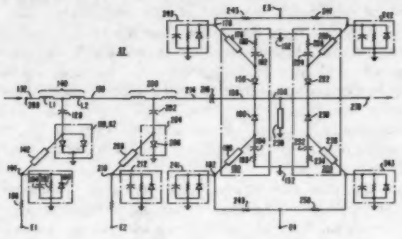
1. A receiver protector stage of a radar for attenuating high power input signals, said stage including:

a semiconductor diode package having a base and a lid enclosure, said lid enclosure containing at least one semiconductor diode chip therein, a cathode of said diode being coupled electrically to said base and an anode of said diode being coupled electrically to said lid enclosure with a metallic conductor which exhibits significant inductive impedance at the microwave frequencies of the high power input signals being attenuated;

a metallic ground plane substrate having a well section contoured for supporting said semiconductor diode package substantially upright with base down within said substrate and with the top surface of said lid enclosure close to the level of the plane of the top surface of said substrate;

at least two dielectric microstrip transmission lines disposed on the top surface of said substrate and extending in different circuit paths from said well section;

a chip capacitor having one and another surfaces oppositely



disposed, said chip capacitor being seated on the top surface of said lid enclosure with one surface of said chip capacitor in electrical contact with said lid enclosure top surface; and

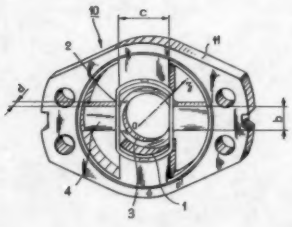
a conductor section bridging said well section to make electrical contact between the another surface of said chip capacitor and said dielectric microstrip transmission paths extending from said well section.

4,371,852

VARIABLE PITCH DELAY LINE FOR TRAVELLING-WAVE TUBE AND TRAVELLING-WAVE TUBE EQUIPPED WITH SUCH A LINE

Christian Deville, and Philippe Lafuma, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 27, 1980, Ser. No. 163,541
Claims priority, application France, Jul. 3, 1979, 79 17201
Int. Cl.³ H01P *9/00*; H01J *23/24*
U.S. Cl. 333—157 **9 Claims**



1. A variable pitch delay line for travelling wave tube constituted by cells each of which comprises the following arrangement of elements:

a metal waveguide portion having a hollow cross-section with an axis orthogonally directed with regard to the planes limiting said portion on either side and comprising tops or teeth which project from the periphery of the cross-section towards the centre of the same;

spaced from the tops, a coaxial metal ring fixed to the periphery of the cross-section by supporting rods facing the free spaces between the rods;

a conducting loop in contact with the tops and causing them to be short-circuited, said cells being stacked so as to constitute a wave guide of uniform cross-section in which the tops on the one hand and the supporting rods on the other hand are aligned with one another, an alectron beam

propagating in operation along the axis of the wave guide, wherein, for a given cross-section, the cells are varied along said axis by varying at least one of the dimensions in said arrangement, whereby the pitch, that is the distance between homologous points of two consecutive cells, is allowed to vary along said delay line.

4,371,853

STRIP-LINE RESONATOR AND A BAND PASS FILTER HAVING THE SAME

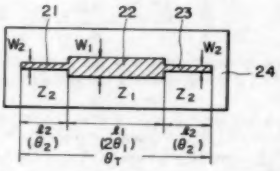
Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Oct. 29, 1980, Ser. No. 201,541

Claims priority, application Japan, Oct. 30, 1979, 54-140958; Dec. 17, 1979, 54-164428

Int. Cl.³ H01P *1/203, 1/212, 7/08*

U.S. Cl. 333—204 **18 Claims**



1. A strip-line resonator comprising:

(a) a substrate made of a dielectric;

(b) a ground-plane conductor attached to one surface of said substrate; and

(c) a strip-line conductor placed on the other surface of said substrate, said strip-line conductor being formed of first and second open-ended conductors and a center conductor interposed between said first and second open-ended conductors, the impedance of said center conductor being lower than the impedances of said first and second open-ended conductors.

4,371,854

BROADBAND HIGH-POWER MICROWAVE WINDOW ASSEMBLY

Seymour B. Cohn, Los Angeles; Arthur Karp, Palo Alto, and David S. Stone, Los Altos, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 27, 1981, Ser. No. 258,065

Int. Cl.³ H01P *1/08*

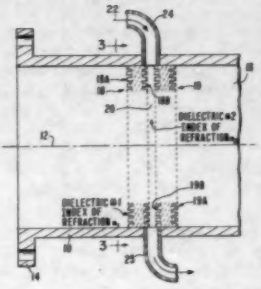
U.S. Cl. 333—252 **27 Claims**

1. A window assembly for a microwave waveguide including a hollow cross-section, comprising:

a plate of dielectric material of first refractive index n_1 extending across an interior hollow section of said waveguide and sealed to the interior of said section, said plate defining two opposed faces;

a fluid of second refractive index n_2 within a region of said waveguide interior on one side of said plate and in contact with one of said faces;

at least said one face having a pattern of corrugations across the area of said face, said corrugations each projecting an axial height h into said fluid, said height h being proportional to the geometric mean of the inverse of the product of the refractive indices n_1 and n_2;



and means for circulating said fluid over said one face so as to cool said plate.

4,371,855

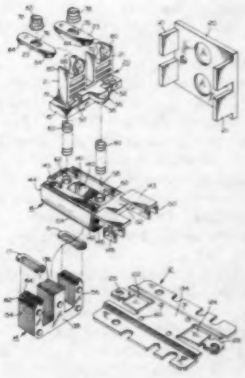
ELECTRICAL CONTACTOR

Richard S. Lenzing, Farmington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 30, 1981, Ser. No. 230,166

Int. Cl.³ H01H *50/02*

U.S. Cl. 335—132 **10 Claims**



1. A contactor comprising in combination,

(a) a moveable contact carrier;

(b) an insulating member extending about said moveable contact carrier and comprising base portions and means for guiding longitudinal movement of said contact carrier;

(c) stationary contact means fixed on said insulating member;

(d) moveable contact means spring mounted at one end of said contact carrier and extending therefrom so as to be in juxtaposition with respective ones of said stationary contact means;

(e) armature means secured to the other end of said contact carrier and having a planar bottom surface;

(f) a stationary magnet member comprising leg members having a planar surface confronting said armature means;

(g) an operating coil retained on said magnet member;

(h) pole shading means seated on a plurality of said leg members so as to have flange portions extending transversely from said leg members;

(i) said insulating member comprising wall surfaces adapted

to abut against the flange portions of the pole shading means;

(j) a support member comprising a support surface for said stationary magnet member and resilient arms extending therefrom;

(k) means for fastening said resilient arm members to said base portions so that pressure exerted by said support member on said stationary magnet member clamps the flange portions of said pole shading means against the wall surfaces of the insulating member to rigidly retain said stationary magnet member, operating coil and pole shading means between said support member and said insulating member.

4,371,856

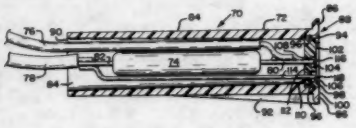
SWITCH ASSEMBLY INCLUDING CIRCUIT TEST POINTS

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Sep. 22, 1980, Ser. No. 189,664

Int. Cl.³ H01H *9/02*

U.S. Cl. 335—202 **10 Claims**



1. A housing for recessed mounting of an electrical circuit component such as an encapsulated magnetic reed switch, comprising:

(a) a tubular barrel having a first end adapted to be exposed flush with a mounting surface when said housing is mounted in a recessed position relative to said mounting surface and a second end adapted to be inserted into an opening through a surface with respect to which said housing is mounted in a recessed position;

(b) end closing means for closing said first end, said end closing means having an outer side and an inner side, said outer side thereof being aligned flush with said first end of said tubular barrel and including a recessed central portion;

(c) at least one orifice extending through said recessed central portion from said inner side to said outer side;

(d) a separate well defined within said recessed central portion surrounding each said orifice, each said well defining a space surrounding the respective orifice permitting insertion of an electrical test probe at least partially within said well; and

(e) said second end of said barrel being open.

4,371,857

ELECTROMAGNETICALLY OPERABLE RAM ACTUATOR IN PARTICULAR FOR IMPACT PRINTERS

Armin Bohg, Weil im Schönbuch, and Kurt Hartmann, Calw-Heumaden, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1981, Ser. No. 261,312

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018407

Int. Cl.³ H01F *3/00, 7/08*

U.S. Cl. 335—259 **5 Claims**

1. An electromagnetic actuator unit assembly comprising

a thin, flat, rectangular frame having a central recess,

a ram actuator carried by said frame comprising

a cylindrical ram shaft slidably supported within guide holes through opposite sides of said frame,

said ram shaft having a central portion within said recess with opposite end portions extending beyond said opposite sides of said frame, and

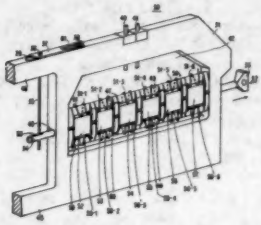
a ram head fixed to one of said end portions outside of said frame,

said ram shaft having a plurality of longitudinally separated magnetic armature disks in said central portion, and

electromagnetic operating means supported by said frame within said recess for actuating said ram actuator in an axial direction,

said operating means comprising upper and lower co-acting electromagnetic stator members,

said stator members comprising magnetic core means having



a plurality of longitudinally spaced magnetic pole pieces and an excitation winding on at least one of said core means,

said magnetic pole pieces of said stator members having opposite pole faces aligned and shaped to form a plurality of longitudinally separated circular operating gaps for receiving one each of said armature disks in said central portion of said actuator shaft, and means supported by said frame member for biasing said ram actuator to a starting position whereby in the non-energized state of said excitation winding said armature disks are positioned in front of their operating gaps and are pulled into said operating gaps upon energization of said winding.

4,371,858

STATIC INDUCTION APPARATUS

Minoru Kanoi, Tokai, and Yasuro Hori, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,772

Claims priority, application Japan, Dec. 18, 1979, 54-163476

Int. Cl.³ H01F *15/00*

U.S. Cl. 336—100 **13 Claims**

1. A static induction apparatus having:

(a) an oil tank which receives therein a main device of the static induction apparatus,

(b) a plurality of reinforcing channels which are disposed on a side plate of the oil tank, and

(c) a sound insulation panel which is carried on the reinforcing channels by a respective elastic body which is mounted to the periphery of the panel, characterized by comprising:

(d) a looped weight beam which is disposed only near the periphery of said sound insulation panel to which each

elastic body is mounted so that the portion of said panel near the periphery is made greater in weight than the weight of the remaining portion of said sound insulation panel located centrally thereof.

4,371,859

COIL SPRING BIASED CURRENT LIMITER

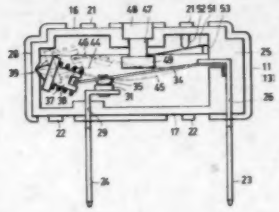
Mitsuo Sorimachi, Isesaki, Japan, assignor to Hoshden Electronics Co., Ltd., Osaka, Japan

Filed Jul. 8, 1981, Ser. No. 281,431

Claims priority, application Japan, Aug. 22, 1980, 55-118850[U]

Int. Cl.³ H01H *37/54, 37/74*

U.S. Cl. 337—365 **9 Claims**



1. A current limiter comprising:

(a) a casing made of an insulating material;

(b) a first fixed terminal mounted in said casing and having one end projecting out of the casing;

(c) a plate-like bimetal housed in said casing and having one end secured to said first fixed terminal, said bimetal supporting a movable contact;

(d) a coil spring having one end held in engagement with the distal end of said bimetal and positioned substantially in alignment with the bimetal, said distal end of the bimetal having an engagement tongue of a reduced width with shoulders on each side thereof, said engagement tongue being inserted in said coil spring with said shoulders held against said one end of the coil spring;

(e) a pivotable lever pivotably supported in said casing and disposed in said coil spring in engagement with the other end of the coil spring, said pivotable lever being fitted substantially in said coil spring to prevent the axis of the coil spring from becoming deflected, said coil spring urging said bimetal toward said one end thereof and said pivotable lever against said casing; and

(f) a second fixed terminal mounted in said casing and having one end projecting out of the casing, said second fixed terminal supporting a fixed contact, said movable contact on the bimetal being normally held against said fixed contact on the second fixed terminal under the bias of said coil spring.

4,371,860

SOLDERABLE VARISTOR

John E. May, Skaneateles, and Steven R. Zohler, North Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 49,223, Jun. 18, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 334,627

Int. Cl.³ H01C *7/12*

U.S. Cl. 338—21 **1 Claim**

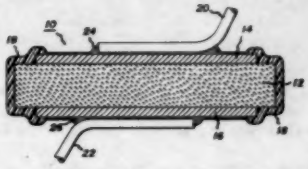
1. A metal oxide varistor having low leakage comprising:

a body consisting essentially of metal oxide and at least one additive;

first and second spaced apart electrodes applied directly to said body;

a protective layer of polyimide silicone on the surface of said body between said electrodes and covering the edges of said electrodes, said layer being resistant to solder and solder-borne contaminants and having respective openings therein exposing and defining a solder attachment region on the surface of each of said electrodes;

each of said electrodes having on its exposed surface a respective layer of solder;



and first and second electrically conductive leads connected respectively to said first and second electrodes by said respective layers of solder.

4,371,861

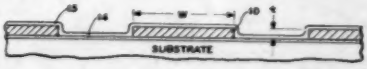
NI-FE THIN-FILM TEMPERATURE SENSOR

Mona Abdelrahman, Minnetonka; Ralph W. Fuchs, Cold Spring; James O. Holman, Minnetonka; Robert G. Johnson, Minnetonka, and M. Walter Scott, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 11, 1980, Ser. No. 215,216

Int. Cl.³ H01C *3/04*

U.S. Cl. 338—25 **12 Claims**



1. A temperature sensing element comprising:

an insulating substrate;

an isolating layer on the surface of said substrate;

a long narrow thin film resistive path of NiFe deposited on the surface of said isolating layer, said resistive path having a narrow width of less than about 15 μm and said resistive path having a thickness in excess of about 400 A°, said NiFe path having a desired temperature coefficient of resistance and by reason of said narrow width and said deposition thickness being relatively insensitive to magnetic field intensity; and,

a passivating layer overlaying the resistive material.

4,371,862

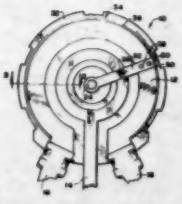
VARIABLE RESISTANCE CONTROL

Ellis P. Lipp, and Jay Utken, both of Frankfort, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 3, 1981, Ser. No. 289,251

Int. Cl.³ H01C *10/34*

U.S. Cl. 338—174 **10 Claims**



1. In a variable resistance control wherein there is an electri-

cal resistance path and an electrical conductive strip and wherein movable electrical contact means electrically bridge the resistance path and the electrical conductive strip, the improvement comprising:

providing a backing means for said resistance path, said backing means consisting essentially of a porcelain enamel metal strip.

4,371,863

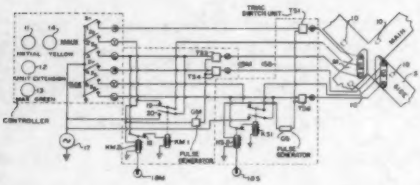
TRAFFIC-ACTUATED CONTROL SYSTEMS PROVIDING AN ADVANCE SIGNAL TO INDICATE WHEN THE DIRECTION OF TRAFFIC WILL CHANGE

George H. Fritzinger, 15 Standish Ave., West Orange, N.J. 07052

Continuation-in-part of Ser. No. 905,350, May 12, 1978, Pat. No. 4,200,860, which is a continuation-in-part of Ser. No. 681,539, Apr. 29, 1976, abandoned. This application Oct. 22, 1979, Ser. No. 87,583

Int. Cl.[3] G08G *1/096, 1/07*

U.S. Cl. 340—43 7 Claims



1. The method of controlling the green and red traffic lights of a traffic system having a traffic-actuated controller and red, green and yellow lights on each roadway of an intersection, to provide an advance signal at a predetermined fixed interval before the direction of traffic will change, which comprises momentarily blinking the red and green lights on the respective roadways at the same instant and concurrently cutting off the traffic actuation of said controller at the start of said interval while continuing the green and red lights on said roadways, terminating the green light at a preset time after the blinking signal and concurrently starting the yellow light on the same roadway, and restoring traffic actuation to said controller when the yellow light times out.

4,371,864

DIGITAL DISPLAY DEVICE OF VEHICLE USE

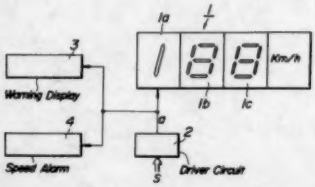
Teruo Kawasaki, Yokohama; Hiroyuki Nomura, Fujisawa, and Mikio Takeuchi, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 14, 1980, Ser. No. 178,007

Claims priority, application Japan, Aug. 24, 1979, 54-107182

Int. Cl.[3] B60Q *1/54;* B60R *21/00*

U.S. Cl. 340—62 8 Claims



1. A digital device for a vehicle for indicating basic information related to the vehicle, including indicating the speed of the vehicle, and provided with a function to control vehicle mounted electrical devices including a speed alarm based on said basic information of the vehicle, the device comprising in combination:

a digital speedometer having indicating portions for respective decimal digits of which each indicating portion comprises at least one segment for visually defining the shape of one or more decimal numbers in a decimal digit, and

a driver circuit associated with each of said indicating portions for sending control signals for turning on the respective segments to provide a digital display of the speed of the vehicle, said driver circuit including means supplying on one control wire leading from said driver circuit a unitary control signal to a particular segment to turn on said particular segment when the speed of said vehicle exceeds a certain limit, and including circuit means branching said unitary control signal and supplying the branched unitary control signal to said speed alarm to activate said speed alarm whenever said unitary control signal is supplied on said one wire to turn on said particular segment.

4,371,865

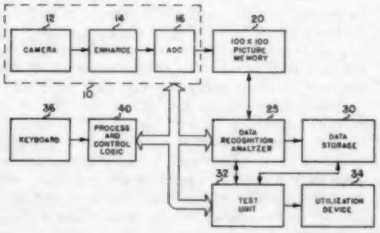
METHOD FOR ANALYZING STORED IMAGE DETAILS

Clifford H. Moulton, Portland, Oreg., assignor to Palmguard, Inc., Beaverton, Oreg.

Filed Jul. 3, 1980, Ser. No. 165,603

Int. Cl.[3] G06K *9/46*

U.S. Cl. 340—146.3 MA 9 Claims



1. A method of recognizing an image to provide identification thereof, comprising the steps of:

storing said image in a picture storage device comprising an array of addressable picture elements each containing numerical data corresponding to levels of light;

electronically selecting one or more three-dimensional slopes between selected pairs of addressable fixed locations by subtracting numerical data stored in one or more picture elements at a first fixed location from numerical data stored in one or more picture elements at a second fixed location;

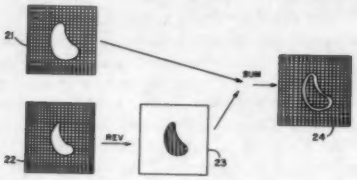
comparing said selected slopes with stored slopes previously selected from substantially the same locations of a prior image to determine a correlation therebetween; and

providing an identification of recognition based upon the degree of correlation between said selected slopes and said stored slopes.

4,371,866
REAL-TIME TRANSFORMATION OF INCOHERENT LIGHT IMAGES TO EDGE-ENHANCED DARKFIELD REPRESENTATION FOR CROSS-CORRELATION APPLICATIONS

James L. Smith, Grand Prairie, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 21, 1980, Ser. No. 208,961
Int. Cl.³ G06K 9/58
U.S. Cl. 340—146.3 F 8 Claims

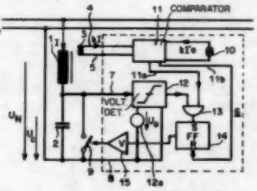


1. A system for providing an edge-enhanced representation of an object comprising a lens means having a focus plane; a recording means located between the focus plane and said lens means so as to receive light reflected from the object and focused through said lens means; a dual-aperture means located between the light from said object and said lens means so as to alternately aperture the lens with a perimeter stop which blocks off the outer lens region and with a central stop which blocks off the central region of said lens means; and said recording means combining the image received from said perimeter stop with an image received from said central stop as to produce an edge-enhanced representation of the object.

4,371,867
TRANSMITTING SIGNALS OVER ALTERNATING CURRENT POWER NETWORKS

Jean-Gabriel Gander, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Continuation of Ser. No. 863,468, Dec. 22, 1977, abandoned.
This application Oct. 1, 1980, Ser. No. 192,827
Claims priority, application Switzerland, Aug. 25, 1977, 10387/77
Int. Cl.³ H04B 3/54
U.S. Cl. 340—310 R 14 Claims

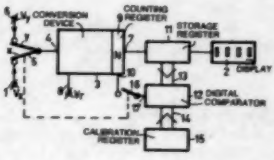


1. A method of producing intelligence signals for transmission over the lines of an alternating current power supply network in response to an input reference signal comprising:
connecting a resonant circuit including a capacitive device to the lines of the power supply network;
controlling the charging and discharging of said capacitive device from the power supply network;
said charging and discharging of said capacitive device being controlled in response to intelligence to be transmitted to periodically charge said capacitive device so that said resonant circuit produces an intelligence signal for transmission over the power supply network; and
wherein said control is effected in dependence on a comparison of the current flowing through said resonant circuit and the reference signal.

4,371,868
METHOD AND DEVICE FOR THE AUTOMATIC CALIBRATION OF AN ANALOG-TO-DIGITAL CONVERTER

Robert E. J. Van de Grift; Rudy J. Van de Plassche, and Eise C. Dijkmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 954,260, Oct. 24, 1978, abandoned.
This application Sep. 2, 1980, Ser. No. 183,523
Claims priority, application Netherlands, Aug. 11, 1977, 7712273
Int. Cl.³ H03K 13/20
U.S. Cl. 340—347 CC 3 Claims

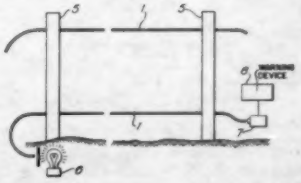


1. An analog-to-digital converter with automatic calibration having an analog frequency converter, a gate circuit, a timer comprising a counting register, a clock, and a pulse counter which supplies the digital output signal after counting the number of pulses from said analog frequency converter during the time interval defined by said timer, characterized in that:
in the calibration mode a digital filter circuit is connected between the output of the frequency converter and the input of the pulse counter of said converter after each calibration measurement the digital difference signal is applied to a buffer register, which is connected to the counting register for adjusting the total counting capacity.

4,371,869
FENCE OR WALL INCORPORATING FIBRE-OPTIC WAVE-GUIDE

Roderick I. Davidson, Paris, France, assignor to Fibun B.V., Netherlands

Continuation of Ser. No. 943,693, Sep. 19, 1978, Pat. No. 4,275,294. This application Jan. 7, 1981, Ser. No. 223,134
Claims priority, application United Kingdom, Sep. 28, 1977, 40412/77; May 31, 1978, 40412/77
The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.
Int. Cl.³ G08B 13/18
U.S. Cl. 340—557 6 Claims



1. A fence or wall comprising a series of supports defining a boundary, a plurality of strands extending between the supports, at least one of the strands containing a fibre-optic wave-guide, means for transmitting light into one end of each fibre-optic wave-guide, means for receiving light emanating from

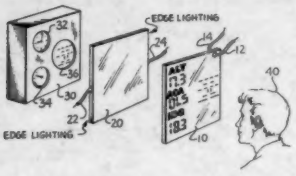
the other end of each fibre-optic wave-guide, and an alarm device responsive to a change in the light received from any fibre-optic wave-guide.

4,371,870

FAIL TRANSPARENT LCD DISPLAY WITH BACKUP

Michael A. Biferno, Duarte, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 2, 1980, Ser. No. 183,346
Int. Cl.³ G09G 3/36
U.S. Cl. 340—716 **8 Claims**



1. A display system comprising:

a primary liquid crystal display comprising a first liquid crystal display means located closest to a viewer wherein information is presented to the viewer within an at least one information location on the first display means, and a second liquid crystal display means located an effective distance behind the first display means wherein substantially all of the second liquid crystal display means operates in a reflective mode; and

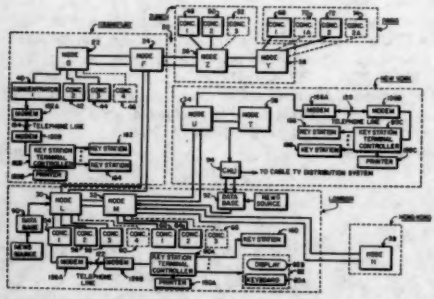
a secondary display wherein the secondary display is located directly behind the primary display such that, upon a termination of power to the primary display, the primary display becomes substantially transparent and the secondary display then becomes visible to the viewer.

4,371,871

ALERT MESSAGE COMMUNICATION SYSTEM

John H. Adams, Dorking, England, assignor to Reuters Limited, London, England

Filed Jan. 30, 1981, Ser. No. 230,412
Int. Cl.³ G09G 1/00
U.S. Cl. 340—717 **20 Claims**

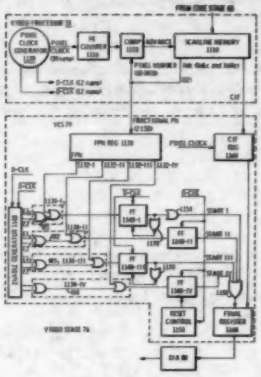


1. In a communication network capable of providing textual data messages to a plurality of subscriber terminals throughout the said network, at least a portion of said plurality of subscriber terminals comprising keystations, each of said keystations comprising a keyboard means for requesting and inputting textual data messages and associated data control signals and display means for providing a textual display of said keyboard generated data input; the improvement comprising a plurality of message switching node interface means operatively connected to each other at different geographic locations throughout the network and a plurality of keystation controller interface means with at least one keystation being operatively connected to one of said keystation controller interface means for each of said message switching node interface means, each of said message switching node interface means comprising message routing logic means and local storage means operatively connected to said message routing local control means for providing message routing logic control signals thereto, each of said keystation controller interface means comprising display control logic means and local display storage means for locally storing textual data to be displayed on said one connected keystation display means, said one connected keystation keyboard means comprising means for inputting a plurality of selectable message routing logic control signals to said node interface local storage means for creating a locally stored alert message routing control page comprising a plurality of different selectable message routing logic control signals, each of said keystation controller interface means having a unique address message code in said network corresponding to a unique logic control signal, each of said different locally stored alert message routing logic control signals comprising at least one of said controller interface unique address code logic control signals, different sets of said controller interface unique address code logic control signals comprising said different selectable message routing logic control signals, each of said one connected keystation keyboard means further comprising means for providing an original textual data alert message and selection control signal to said keystation controller interface means for selecting at least one of said different alert message routing logic control signals for uniquely defining a keystation recipient group for said original input textual data alert message, said keystation controller interface means comprising logic means responsive to said provided textual data alert message and selection control signals for providing said textual data alert message and selection control signal to said node interface means message routing logic means associated with said original message providing keystation, said message switching node interface logic means being responsive to said selection control signal for selecting said at least one corresponding locally stored alert message routing logic signal and for transmitting said one selected alert message routing logic signal and said original textual data alert message to at least a keystation recipient group plurality of node interface means corresponding to said controller interface unique address code logic control signals comprised in said selected alert message routing logic control signal, said keystation recipient group node interface logic means selectively routing said received textual data alert message to said connected keystation controller interface means corresponding to said node interface associated controller interface unique address code logic control signals defined in said keystation recipient group, said associated keystation controller interface means locally storing said received alert message in said local display storage means for providing a display thereof on said one connected keystation display means in said selected keystation recipient group, said message originating keystation keyboard means being capable of varying both the content of said textual data alert message to be transmitted and the recipients for said transmitted alert message by varying either the contents of said locally stored alert message routing control page or the alert message routing logic control signal selected; whereby any of said keystations in the network can rapidly disseminate individually tailored alert messages to individually tailored recipients therefor for display thereof.

4,371,872
FRACTIONAL CLOCK EDGE SMOOTHER FOR A REAL-TIME SIMULATION OF A POLYGON FACE OBJECT SYSTEM

Walter A. Rossman, Cupertino, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,819
Int. Cl.³ G09G 1/16
U.S. Cl. 340—728 **6 Claims**



1. An image data system responsive to digital image data including position data which defines the position of the vertices of polygon faces forming the image, and corresponding visual data which defines the visual characteristics of each face, for providing digital display data to a scanline-pixel type display device, comprising:

image processor means for receiving the image position data and providing the display coordinates for each vertex of each polygon face of the image to be displayed on the display device;

means responsive to the display coordinates of each vertex for determining the scanline numbers and pixel numbers within each scanline of the sequence of leading and trailing intersections of the edges of each face with the scanlines, and responsive to the corresponding visual data for providing a video signal to the display device along each scanline between the leading and trailing edge intersections of each face for generating the corresponding visual characteristics for that face on the display device;

scanline memory for receiving each scanline number and the pixel numbers of each intersection within that scanline and the corresponding visual data, and for sequentially providing each intersection pixel number and corresponding data by order of scanline and pixel;

pixel clock for the scanlines;

pixel counter for sequentially incrementing in response to the pixel clock to define the current pixel count as each scanline proceeds;

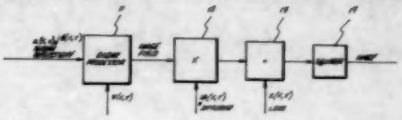
comparator means for comparing the most significant bit portion of the current intersection pixel number with the current pixel count to advance the corresponding visual data out of the scanline memory;

fractional pixel means responsive to the least significant bit portion of the current intersection pixel number for providing a series of progressively and non-uniformly delayed display start times within the current pixel for controlling the display of the corresponding visual data.

4,371,873
CLUTTER FREE SYNTHETIC APERTURE RADAR CORRELATOR

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Atul Jain, Pasadena, Calif.

Filed Dec. 8, 1977, Ser. No. 858,767
Int. Cl.³ G01S 13/89, 13/90
U.S. Cl. 343—9 PS **6 Claims**



1. A radar processing system supplied with terrain reflectivity and radar impulse response indications comprising:

a radar processor means for providing a radar image field plane;

a moving diffuser located at the image field plane of said radar processor and providing an output image; and

a lens means having an impulse response at least as wide as the impulse response of the radar system, for reimaging said output image.

4,371,874
CHAFF DIPOLE ELEMENTS AND METHOD OF PACKAGING

Richard L. Bloom, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 401,933
Int. Cl.³ G01S 7/38
U.S. Cl. 343—18 B **7 Claims**

3. A mixture of a plurality of different type electromagnetic radiation relfective metal, chaff dipole elements for packaging into a dispenser for chaff dispersion;

each different type element formed by a different type of metal with the same length and cross sectional area, but of different weight,

whereby each different type metal dipole element has a different fall rate when simultaneously dispensed.

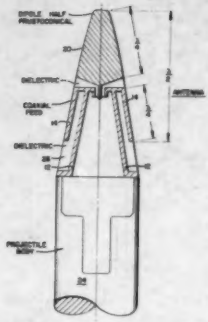
4,371,875
PROJECTILE ANTENNA

Wolfgang Keydel, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1975, Ser. No. 623,557
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1974, 2450063
Int. Cl.³ H01Q 1/28
U.S. Cl. 343—708 **5 Claims**

1. An antenna for an electronic projectile detonator, with the antenna producing a desired antenna diagram which is rotationally symmetrical about the longitudinal axis of the projectile, said antenna comprising: a dipole which is fed through a coaxial feeder line and decoupled from said feeder line by means of a $\lambda/4$ wave trap (λ = operating wavelength), said dipole and said wave trap being realized by a frustoconical widened portion of a $\lambda/4$ extension of the inner conductor of the feeder line which coincides, as regards position and direction, with the longitudinal axis of the projectile at the feed point, said widened portion constituting the detonator head in the tip of the projectile, and a $\lambda/4$ conductive sleeve which is

rotationally symmetrical to the longitudinal axis of the projectile and surrounds said coaxial feeder line, and is connected to



the outer conductor of said coaxial feeder line only at said feed point of said antenna.

4,371,876

SLOT ARRAY ANTENNA HAVING A COMPLEX IMPEDANCE TERMINATION AND METHOD OF FABRICATION

Johnny R. Nash, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 902,629, May 4, 1978, abandoned. This application Jul. 17, 1979, Ser. No. 58,411

Int. Cl.³ H01Q *13/10*

U.S. Cl. 343—768 **6 Claims**

1. A slot array antenna having a predetermined required pattern, comprising:

(a) a portion of a waveguide having an input end and a termination end;

(b) a plurality of slots disposed in said waveguide, each adjacent pair of said slots being longitudinally and variably spaced one from the other by distances responsive to the required array antenna pattern; and

(c) termination means for providing a reflection coefficient of substantially less than unity and substantially greater than zero, said termination means being in said termination end of said waveguide and having a complex impedance equal to a quotient of termination end voltage divided by termination end current as derived from said spacing of said plurality of slots.

4,371,877

THIN-STRUCTURE AERIAL

Michel Doussot, Fontenay Aux Roses, and Christian Courtois, Briis sous Forge, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,349

Claims priority, application France, Apr. 23, 1980, 80 09070

Int. Cl.³ H01Q *13/10*

U.S. Cl. 343—770 **7 Claims**

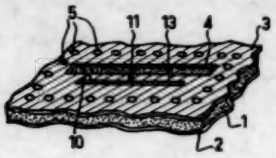
1. An aerial comprising a sheet of dielectric having front and rear surfaces each covered with a layer of conductive material, the conductive layer on the front surface including:

(a) at least one radiating slot;

(b) at least one feed slot parallel to a radiating slot;

(c) a conductive portion bounded by at least two of the slots in the layer;

(d) a feed point in said conductive portion; and



(e) means for defining sidewalls of a cavity which is disposed between said layers of conductive material, said side walls surrounding at least one radiating slot and said parallel feed slot.

4,371,878

DEVICE FOR CORRECTING INK DOT MISPLACEMENT IN INK-JET PRINTING

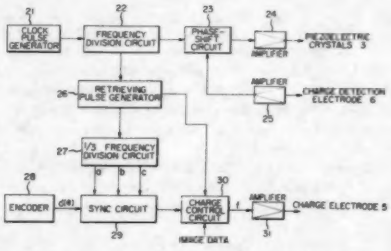
Koichiro Jinnai, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,575

Claims priority, application Japan, Mar. 17, 1980, 55-33789

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **4 Claims**



1. An electrostatic type ink-jet printer of the type leaving guard drops between charged drops, comprising:

a rotary drum for supporting a record medium;

an ink jet generator adjacent said drum for providing a stream of ink drops, in response to a corresponding excitation signal;

first pulse generating means for providing said excitation signal at a given frequency;

frequency dividing means for generating polyphase pulse trains synchronous with said excitation signal at a submultiple of said given frequency;

sync pulse generating means coupled to said rotary drum for providing sync pulses at predetermined rotational positions thereof;

a sync circuit responsive to said polyphase pulse trains and said sync pulses for providing charging pulses corresponding to that one of said polyphase pulse trains which contains a pulse coincident with a predetermined part of each of said sync pulses; and

means responsive to said charging pulses for charging corresponding ones of said ink drops in said stream provided by said ink drop generator, to charge each ink drop which immediately succeeds a corresponding one of said sync pulses.

4,371,879

METALIZED RECORDING CARRIER FOR RECORDING INSTRUMENTS, AND METHOD OF ITS MANUFACTURE

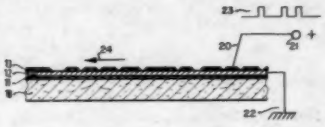
Richard Höhn, Stuttgart; Werner Jung, Waiblingen; Gerhard Winter, Remshalden, and Siegfried Woerner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,611

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017450

Int. Cl.³ G01D *15/24*

U.S. Cl. 346—135.1 19 Claims



1. Metalized recording medium for recording instruments of the burn-out recording type upon being subjected to an electrical discharge from an electrode (20) having a contacting surface which is being passed over the surface of the medium, comprising

a substrate carrier (10);

a metal layer (12) supported by the carrier and of a thickness permitting burning-off of the metal layer when positioned beneath an energized electrode (20);

and a low-friction surface layer applied over said metal layer,

wherein, in accordance with the invention,

the low-friction slide surface layer (13) is formed, prior to contact with an energized electrode, of discontinuous islands smaller than the contacting surface of the electrode (20) to permit easy gliding of the electrode (20) over the surface of the carrier without marring or scratching or leaving tracks on the carrier upon relative movement between the carrier and the electrode while providing for electrical connection of the electrode with said metal layer (12).

4,371,880

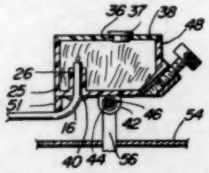
DISPOSABLE STYLUS AND RESERVOIR

Donald A. Peterson, Berwyn, Ill., assignor to Stoelting Co., Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,490

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R 2 Claims



1. A disposable stylus and housing therefor comprising a hollow housing having top, bottom, front and rear end walls, an interiorly threaded hollow portion on said rear wall medially of said side walls and extending angularly upwardly from said bottom wall, a headed screw disposed therein, a cylindrical tube extending upwardly in said housing and integrally formed on said bottom wall adjacent said front end wall, said tube communicating with the interior of said housing and outside of said bottom wall, a horizontally-extending stylus, one end of said stylus bent at right angles upwardly and rigidly seated in said tube, the opposite end of said stylus bent downwardly, a penpoint in said latter end, a wick in said stylus, fibrous material packed in said housing, filling means whereby to supply ink interiorly of said housing and said filling means then being plugged, a pair of ears each extending downwardly from the lower ends of said side walls and containing a perforation in each ear and a pivot pin extending between and through said perforations.

4,371,881

PIVOTABLE INK-REPELLING SCREEN FOR THE WRITING HEAD OF AN INK RECORDING DEVICE

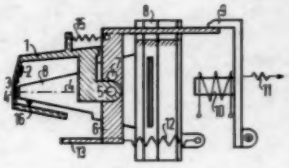
Klaus Bork, and Alfred Rueckerl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,568

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021913

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 13 Claims



1. Apparatus for shielding and cleaning a writing head for an ink recording device having a plurality of ink dispensing openings comprising a shield member substantially enclosing said writing head adjacent said openings and movable between a position unobstructive to flow from said openings and a position blocking said openings, said shield member having a resilient flap element and a closure portion attached thereto, whereby movement of said shield member to said blocking position causes said flap element to first wipe said openings followed by said closure portion covering said openings.

4,371,882

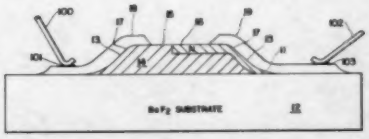
PROCESS FOR PREPARING ISOLATED JUNCTIONS IN THIN-FILM SEMICONDUCTORS

Hayden Morris, Washington, D.C., and Richard F. Bis, Mount Airy, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1978, Ser. No. 926,364

Int. Cl.³ H01L *27/12*

U.S. Cl. 357—4 8 Claims



1. A thin-film device, comprising:

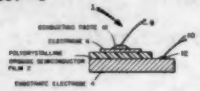
an electrically insulating substrate;

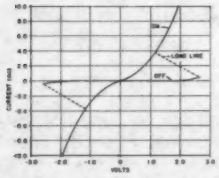
a layer of a semiconductor material comprising a plurality of fingers each having a jointed end with a first type conductivity separated by a predominately planar junction from a distal end with a second and opposite type conductivity and a shorting section abutting each joined end;

a plateau central to the layer describing a plane substantially parallel to the surface;

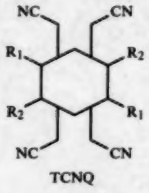
a rounded rim bordering the plateau; and
sloping sides joining the rounded rim with the surface of the substrate.

4,371,883
CURRENT CONTROLLED BISTABLE ELECTRICAL ORGANIC THIN FILM SWITCHING DEVICE
Richard S. Potember; Theodore O. Poehler, Jr., both of Baltimore, and Dwaine O. Cowan, Towson, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Mar. 14, 1980, Ser. No. 130,400
Int. Cl.³ H01L *29/28*
U.S. Cl. 357—8 **27 Claims**





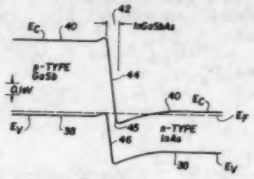
1. An electric, current-controlled device for providing stable, reproducible switching comprising:
a thin film which comprises:
a metal wherein the metal is a material selected from the group consisting of copper and silver, and
an electron acceptor combined with the metal wherein the electron acceptor is a material selected from the group consisting of tetracyanoquinodimethane (TCNQ), tetracyanonapthoquinodimethane (TNAP), and any of the TCNQ derivatives defined by the notation:



TCNQ

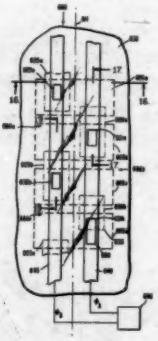
wherein
R_1=H, R_2=—H;
R_1=CH_3, R_2=—H;
R_1=—OCH_3, R_2=—H; or
R_1=F, R_2=—F; and,
an electric field applied across said film, said applied field being sufficient to induce a solid state reversible electrochemical reaction in said film wherein said electrochemical reaction causes a detectable switching in electrical impedance from a first to a second impedance state in said thin film.

4,371,884
INAS-GASB TUNNEL DIODE
Leo Esaki, Chappaqua, and Chin-An Chang, Peekskill, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 23, 1981, Ser. No. 227,890
Int. Cl.³ H01L *29/88*
U.S. Cl. 357—12 **15 Claims**



1. A high speed semiconductor device exhibiting a tunneling characteristic, comprising in combination:
first and second semiconductor regions having a mutually different composition and conductivity type separated by a relatively thin interface layer having a composition including the constituent materials of both said first and second semiconductor regions, said first and second semiconductor regions having energy band gaps which are shifted in mutually opposite directions and where said interface layer is sufficiently thin that the mechanism for carrier transfer between said first and second semiconductor regions is tunneling through said interface layer.

4,371,885
CHARGE COUPLED DEVICE IMPROVED MEANDER CHANNEL SERIAL REGISTER
William J. Parrish, Santa Barbara, and James L. Gates, Vista, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Continuation of Ser. No. 83,422, Oct. 10, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,994
Int. Cl.³ H01L *29/78;* G11C *19/28;* H01L *29/04*
U.S. Cl. 357—24 **14 Claims**



1. A charge coupled device formed on a semiconductor substrate for transferring charge in a meander path having right and left regions extending in a first direction in a plane, comprising:
first insulated electrode means for controlling charge flow having a plurality of conductive portions, each of said portions extending in a second direction at least partially across said right and left regions;
second insulated electrode means extending in said first direction, alternate pairs of adjacent ones of said first electrode means and said second electrode means at least

partially overlapping for controlling charge flow in said right region;

third insulated electrode means extending in said first direction, the remaining pairs of adjacent ones of said first electrode means and said third electrode means at least partially overlapping for controlling charge flow in said left region; and

means for applying clock signals to selected ones of said first, second and third electrode means, wherein said second and third electrode means comprise a plurality of discrete electrodes, each of said discrete electrodes overlapping adjacent pairs of said first electrode means.

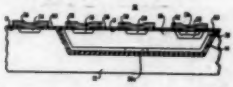
4,371,886

HIGH VOLTAGE DIELECTRICALLY ISOLATED DUAL GATE SOLID-STATE SWITCH

Adrian R. Hartman, New Providence; Alfred U. MacRae, Berkeley Heights, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 972,021, Dec. 20, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 107,772

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **23 Claims**

1. A structure comprising a semiconductor body (16) whose bulk is of one conductivity type and which has a major surface (11), a localized first region (18) which is of the one conductivity type, and a localized second region (20) and a localized third region (24) which are both of the opposite conductivity type, each of the localized first (18), second (20), and third (24) regions being of relatively low resistivity as compared to the bulk portion of semiconductor body (16) and being spaced apart from the others, and separate electrodes (28, 30 and 32) being connected to each of the first (18), second (20), and third (24) regions, the localized first (18), second (20), and third (24) regions each having a portion thereof which forms a part of surface (11), the semiconductor body (16) is separated from a semiconductor wafer (substrate) (12) by a dielectric layer (14), the semiconductor wafer (substrate) (12) is adapted to facilitate connection to an electrode (36) and is CHARACTERIZED BY:

a localized fourth layer (38, 38*a*) of the same conductivity type as the third region, the fourth regions being sandwiched between the dielectric layer (14) and the semiconductor body (16).

4,371,887

HIGH VOLTAGE SOLID-STATE SWITCH

Adrian R. Hartman, New Providence; Terence J. Riley, Warren, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1979, Ser. No. 107,775

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **11 Claims**

1. A switching device comprising a semiconductor body (16), a bulk portion of which is of a first conductivity type, a first region (18) located within the body (16) of a second conductivity type that is opposite that of the first conductivity type, a second region (24) located within the body (16) and being of the first conductivity type, a third region (22) of the second conductivity type, the third region (22) surrounds and contacts the second region, a gate region (20) located within the body (16) and being of the first conductivity type; the first (18), third (22), and gate (20) regions being mutually separated by portions of the bulk of the semiconductor body (16) and being contained on a first major surface of the body (16), the resistivity of the bulk of the body (16) being higher than the resistivity of the first (18), second (24), third (22), and gate (20) regions, the parameters of the device being such that, with a first voltage applied to the gate region, depletion regions are formed in the body (16) and the potential of the portion of the bulk below the gate region (22) and above the dielectric layer (24) is more positive than that of the first, second, and third regions (18, 22, 24) such that current flow between the first and

second regions (18, 24) is substantially inhibited, and that, with a second voltage applied to the gate region (20) and with appropriate voltages applied to the first and second regions (18, 24), a relatively low resistance current path is established between the first and second regions (18, 24) by dual carrier injection, characterized in that the gate region (20) is located essentially directly between the first region (18) and the third region (22).

4,371,888

Patent Not Issued For This Number

4,371,889

Patent Not Issued For This Number

4,371,890

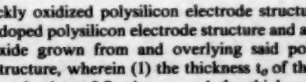
TAPERING OF OXIDIZED POLYSILICON ELECTRODES

Constantine N. Anagnostopoulos, Mendon, and Deepak K. Ranadive, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,957

Int. Cl.³ H01L *29/04*

U.S. Cl. 357—59 **8 Claims**



1. A thickly oxidized polysilicon electrode structure comprised of a doped polysilicon electrode structure and a layer of silicon dioxide grown from and overlying said polysilicon electrode structure, wherein (1) the thickness t_o of the silicon dioxide layer is about 0.7 microns and the thickness of the underlying polysilicon is about 0.6 microns such that $t_o \leq 1.5\ t_{ps}$, where t_{ps} is the thickness of the underlying polysilicon, and (2) the profile of the thickly oxidized polysilicon electrode structure at an edge thereof is tapered so as not to have an inward curvature.

4,371,891

CHROMINANCE SIGNAL PROCESSOR

Thomas D. Yost, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

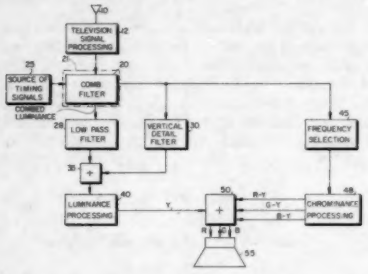
Filed Apr. 10, 1981, Ser. No. 252,818

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **13 Claims**

1. A color television receiver system for processing a video

signal containing a luminance component, and a chrominance component with a modulated color subcarrier, disposed within a frequency spectrum of said video signal in frequency interleaved relation, including: a source of timing signals; a comb filter responsive to said video signal and to said timing signals for providing at a first output a combed luminance signal with amplitude peaks at integral multiples of an image line scanning frequency and amplitude nulls at odd multiples of one-half said line frequency, and for providing at a second output a signal with amplitude peaks at odd multiples of one-half said line frequency and amplitude nulls at integral multiples of said line frequency; means for demodulating chrominance signals derived from said second output of said comb filter; and signal translating means included in a signal coupling path between said second comb filter output and said demodulating means, and responsive to signals from said second comb filter output



for supplying chrominance signals to said demodulating means with a substantially symmetrical amplitude and linear phase response, said signal translating means comprising:

first bandpass filter means for receiving signals from said second output of said comb filter inclusive of said desired chrominance signals and undesired components at the frequency of said signal, said first filter means comprising first and second cascaded resonant circuits tuned to provide a maximum amplitude response at a frequency greater than the frequency of said color subcarrier; and

second bandpass filter means with an input for receiving filtered signals from said first bandpass filter means, and an output coupled to said demodulating means, said second filter means being tuned to provide a maximum amplitude response at a frequency greater than said color subcarrier frequency.

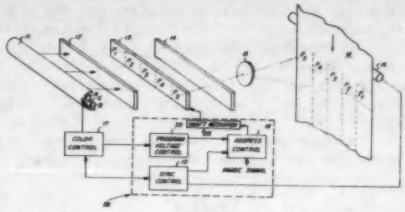
4,371,892

LIGHT VALVE IMAGING WITH OPTIMIZED ADDRESSING POTENTIAL(S) TO REDUCE INTER-PIXEL NONUNIFORMITY

Jose M. Mir, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1981, Ser. No. 230,095
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **22 Claims**

1. In electronic imaging apparatus of the type including (1) an electro-optic light valve array which comprises a plurality of discretely addressable elements, (2) means for illuminating elements of said array with light and (3) addressing means for activating said elements between light transmitting and non-transmitting conditions in accordance with image information, the improvement wherein said addressing means is adapted to apply to said elements, during all activating sequences of each activation period, predetermined nominal activating potential(s) of magnitude selected to minimize inter-element light



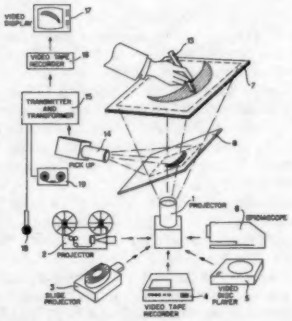
transmission variation, whereby the light transmissions of the elements of said light valve array are rendered more uniform.

4,371,893

VIDEO COMMUNICATION SYSTEM ALLOWING GRAPHIC ADDITIONS TO THE IMAGES COMMUNICATED

Andre J. Rabeisen, 14 rue Philippe le Hardi, 21000 Dijon, France

Filed Sep. 3, 1980, Ser. No. 183,747
Claims priority, application France, Sep. 11, 1979, 79 22653
Int. Cl.³ H04N *5/22*
U.S. Cl. 358—93 **5 Claims**



1. A system of video communication, comprising a screen, means for projecting images on the screen from beneath the screen, the screen having one transparent lower surface adapted to transmit the images and one semi-transparent upper surface adapted to receive visible markings thereon with the aid of an implement held by a user of the system, opto-electronic means directed toward said lower surface of said screen to pick up from said screen a composite image comprised by the projected image and the added markings, and means for transmitting said composite image.

4,371,894

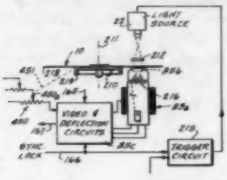
VIDEO DISC TRANSDUCER SYSTEM AND METHOD

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 826,054, Aug. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 519,340, Oct. 30, 1974, abandoned. This application Jan. 11, 1980, Ser. No. 111,461
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—342 **28 Claims**

1. A video transducer system comprising a record disc having a central axis of rotation and having successive radially

offset arcuate track sections each extending arcuately about the central axis, said arcuate track sections each having a series of recorded images recorded thereon and each recorded image comprising an ordered plural dimensional spacial distribution of recorded image elements corresponding to a plural dimensional visual image, with the recorded image elements corresponding to a single visual image providing a recorded image frame and the successive recorded images of said arcuate video



record track presenting a time sequence of said recorded image frames to provide a substantial number of recorded image frames per inch along each arcuate track section of the video record track, means comprising a flashing light source for illuminating said recorded images in sequence, and video camera means for receiving light images of the illuminated recorded images and for transmitting a video signal to electronically reproduce the series of recorded images.

4,371,895

CODED VIDEO SIGNAL TRANSMITTING AND RECEIVING SYSTEM

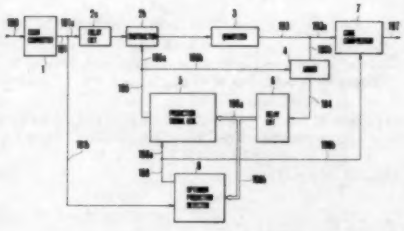
Toshio Koga, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,401

Claims priority, application Japan, Jan. 18, 1980, 55-4379; Sep. 12, 1980, 55-126125; Sep. 12, 1980, 55-126126; Sep. 12, 1980, 55-126127; Dec. 1, 1980, 55-169407

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—136 **9 Claims**



1. A coded video signal transmitting and receiving system comprising in combination a coding apparatus using a plurality of prediction functions and provided for a transmitter, a decoding apparatus provided for a receiver, and coded signal transmission path means, whereby a coded video signal transmitted from the coding apparatus via the transmission path means is received at the decoding apparatus and decoded thereby, said coding apparatus comprising:

scan converter means which forms from, a video signal received in time series two-dimensional blocks each consisting of a plurality of picture elements which extend over a plurality of scanning lines, and outputs the video signal in a different sequence from that of said input time series;

error signal generating means which generates a predictive error value per block with respect to arbitrary one of said plurality of prediction functions associated with each block;

prediction function designation means which designates a prediction function to generate a subsequent prediction error value by use of part or all of prediction error values which have been generated by said error signal generating means;

prediction signal generating means which determines an optimum prediction function selected from prediction functions produced from said prediction function designation means after a predetermined time as elapsed, and generates prediction signals for picture elements in said two-dimensional block sequentially in accordance with said optimum prediction function;

predictive coding means which performs predictive coding by use of said prediction signal and the video signal output from said scan converter means; and

code compressor means which performs compression coding for at least a signal representing said optimum prediction function and the prediction error signal delivered from said predictive coding means, to produce a compressed predictive coding signal,

said decoding apparatus comprising:

means which receives the compressed predictive coding signal sent from the coding apparatus via said transmission path means, for separating said compressed code by expansion into a signal representing said optimum prediction function and a corresponding prediction error signal;

means which receives a supplementary decoded video signal, for generating a prediction signal in accordance with a signal representing a prediction function separated by said separating means;

predictive decoding means which receives an output of said prediction signal generating means and a prediction error signal separated by said separating means, for generating said decoded video signal;

scan inverter means which transforms an output of said prediction decoding means into the video signal in said original time series.

4,371,896

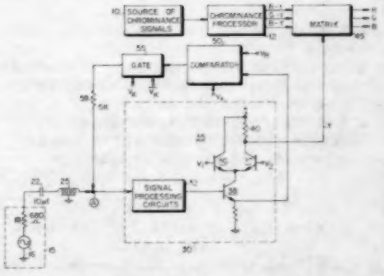
STABILIZED VIDEO SIGNAL CONTROL LOOP

Robert L. Shanley, II, Indianapolis, Ind., and Leopold A. Harwood, Bridgewater, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,823

Int. Cl.³ H04N *5/18*

U.S. Cl. 358—172 **10 Claims**



1. In a video signal processing system including a video signal processing channel and a source of image representative video signal having periodically recurring image intervals, and image blanking intervals between adjacent image intervals and comprising a reference interval containing a black reference level, apparatus comprising:

input means, including a first impedance and an AC signal

coupling capacitor, for AC coupling video signals to an input of said video channel;

control means arranged in a control loop with said video signal processing channel for maintaining a desired video signal black reference level, including

means for comparing said black reference level of said video signal with a reference voltage to develop an output control voltage representative of the differences between said black reference level and said reference voltage;

a second impedance; and

keyed gating means operative during said black reference intervals for conducting said control voltage to said input of said video channel via said second impedance;

means for storing said control voltage conducted to said video channel, said storing means consisting essentially of said AC signal coupling capacitor and wherein

said first impedance, said AC signal coupling capacitor, and said second impedance form a voltage divider network during said black level reference intervals for network during said black level reference intervals for reducing the AC signal gain of said control loop to thereby prevent oscillation of said control loop at AC signal frequencies including video signal frequencies during said reference intervals.

4,371,897

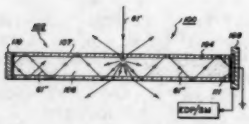
FLUORESCENT ACTIVATED, SPATIALLY QUANTITATIVE LIGHT DETECTOR

Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 183,132, Sep. 2, 1980, abandoned. This application Apr. 27, 1981, Ser. No. 257,694

Int. Cl.³ H04N *1/24*

U.S. Cl. 358—294 **39 Claims**



1. A fluorescent-activated spatial quantitative light detector comprising

an elongated rod-like member, said member comprising a fluorescent dye molecularly dispersed throughout a generally transparent solid material, and

at least one photosensor in operative association with said member to detect fluorescent light emitted by said member upon exposure to incident light.

4,371,898

COMPOSITE INFORMATION RECORDING APPARATUS

Hiroya Nakamura, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 28, 1980, Ser. No. 154,148

Claims priority, application Japan, May 31, 1979, 54-66854; Oct. 31, 1979, 54-139940

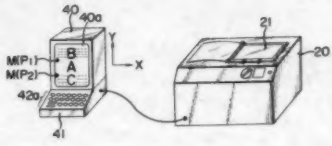
Int. Cl.³ H04N *1/22*

U.S. Cl. 358—300 **4 Claims**

1. In a composite information recording apparatus for recording on a recording sheet a composite image of an original and electric signal information as separate but substantially contiguous portions of the same recording sheet substantially without overlap therebetween, and including a copy board having a portion on which the original is received for electrophotographic copying thereof,

data input means for entering variable information into said apparatus for composite recording with an image of the original and for converting said variable information to electric signal information,

operable means on the copy board adjacent the original receiving portion thereof for indicating the boundaries of the original so as to facilitate placement of the original on the copy board for predetermined placement thereon with respect to the variable information entered into the apparatus for composite recording with an image of the original, and



means for communication between said data input means and said operable means on the copy board for providing an automatic determination of proper and permissible positional correlation between the variable electric signal information and the image of the original for composite recording on the same recording sheet,

said operable means comprising at least a row of illuminating elements disposed along an edge of the copy board original receiving portion for providing a visual display of at least a boundary beyond which the original is to be placed on the copy board for reproduction so as to prevent overlapping thereof with variable information previously entered into said apparatus through said data input means.

4,371,899

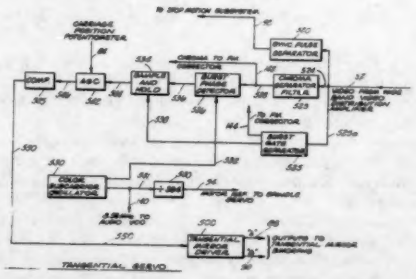
TIME BASE ERROR CORRECTION SYSTEM FOR PLAYER

Ludwig Ceshkovsky, Fountain Valley, and Wayne R. Dakin, Redondo Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 890,670, Mar. 27, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,903

Int. Cl.³ H04N *5/76*; G11B *7/00*

U.S. Cl. 358—315 **22 Claims**



1. A time base error correction system for use in an apparatus for recovering an information signal from an information track recorded on a disc-shaped information bearing surface,

wherein the information signal includes a periodic synchronizing signal that defines a time base, and the apparatus includes optical system means for directing a source beam of radiation to follow along the information track and spindle servo means for rotating the information bearing surface relative to the source beam, to produce a modulated beam of radiation containing the information signal, the optical system means further directing the modulated beam to signal recovery means for recovering the information signal from the modulated beam, the time base error correction system comprising:

separation means for separating the synchronizing signal from the information signal recovered from the modulated beam;

reference signal means for generating a reference signal having a prescribed frequency;

phase detection means for detecting the relative phase between the synchronizing signal and the reference signal, and for generating a control signal representative of error in relative phase;

radial location detection means for detecting the radial location of the source beam relative to the disc;

control signal adjusting means for adjusting the control signal as a function of the radial location of the source beam relative to the disc; and

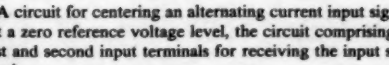
tangential beam steering means responsive to the control signal for steering the source beam tangentially along the information track to vary the rate of relative movement between the source beam and the information bearing surface in a manner correcting for time base errors in the information signal recovered from the modulated beam.

4,371,900

EQUALIZATION OF DC NULL IN REPRODUCING A HIGH DENSITY RECORDING

William D. Huber, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jan. 23, 1981, Ser. No. 227,612
Int. Cl.³ G11B 5/09, 5/45
U.S. Cl. 360—40 **10 Claims**



1. A circuit for centering an alternating current input signal about a zero reference voltage level, the circuit comprising

first and second input terminals for receiving the input signal,

first and second output terminals,

first, second, third and fourth resistors, and

first and second diodes, and wherein

the first input terminal is connected through the first capacitor to the anode of the second diode and through the second capacitor to the cathode of the first diode,

the second input terminal is connected through the third capacitor to the anode of the first diode and through the fourth capacitor to the cathode of the second diode,

the first output terminal is connected through the first resistor to the anode of the second diode and through the second resistor to the cathode of the first diode, and

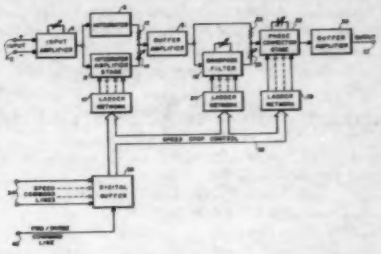
the second output terminal is connected through the third resistor to the anode of the first diode and through the fourth resistor to the cathode of the second diode.

4,371,901

PROGRAMMABLE SIGNAL EQUALIZER

Prabodh L. Shah, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 16, 1980, Ser. No. 197,709
Int. Cl.³ G11B 5/45, 5/02
U.S. Cl. 360—65 **5 Claims**



1. An equalizer amplifier for amplifying an output of a reproduce head in a data recorder having a moving recording medium driven past said reproduce head at a selected one of a plurality of recording medium speeds comprising

a plurality of active RC circuits arranged in a serial circuit, said RC circuits including an integrator circuit, a bandpass filter circuit and a phase corrector circuit,

a separate programmable resistor ladder network for each of said RC circuits, said network having digital word selectable switches for altering the equivalent resistance of the ladder network and

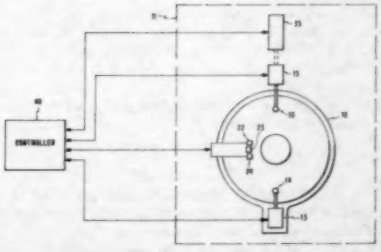
means for concurrently applying to all of said ladder networks a digital word arranged to selectively operate said switches in response to a selected one of the recording medium speeds.

4,371,902

DISK INITIALIZATION METHOD

Duane W. Baxter; Joseph L. Evjen, Jr.; William C. Hoveland, all of Rochester; Roy A. Roble, Byron; Donald R. Smith, Rochester, and John H. Wirz, Pine Island, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,727
Int. Cl.³ G11B 21/02, 21/10
U.S. Cl. 360—75 **8 Claims**



1. The method of initializing sector servo information on the disk storage media of a disk assembly which includes a dedicated transducer subassembly using a servo track writing device comprising:

writing first and second non-adjacent tracks on the surface of said disk storage media using said dedicated transducer subassembly;

measuring the radial position and circumferential timing of

the impulses written relative to the position and timing of said servo track writing device;

determining the radial position and circumferential timing for each pattern to be written; and

successively writing the servo tracks by radially positioning said servo track writing device, circumferentially adjusting the write start timing and writing said servo tracks to provide custom placement of the servo information wherein the location and alignment are tailored to the position and path of travel of the associated dedicated transducer subassembly.

4,371,903

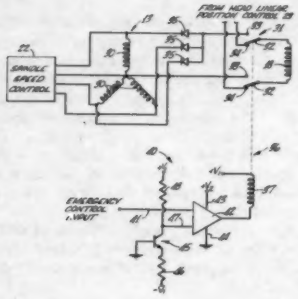
EMERGENCY HEAD RETRACT SYSTEM FOR MAGNETIC DISC DRIVES

Martyn A. Lewis, Pacific Palisades, Calif., assignor to DMA Systems Corporation, Goleta, Calif.

Filed Sep. 28, 1981, Ser. No. 305,941

Int. Cl.³ G11B *5/54, 21/02*

U.S. Cl. 360—75 **9 Claims**



1. In a disc drive including a disc having a magnetic surface and supported for rotation on a spindle, at least one magnetic head movable relative to said disc surface, a spindle motor for driving said spindle, a head support structure coupled to said head, a drive motor having a positioner coil for moving said head support structure so as to move said head along said disc surface, and circuit means responsive to an emergency condition for causing said drive motor positioner coil to retract said head support structure, the improvement wherein said spindle motor is a rotating magnet DC motor and wherein said circuit means comprises:

switch means operatively positioned between the stator windings of said DC motor and said drive motor positioner coil for selectively coupling said coil either to the circuitry which normally drives same or to said stator windings; and

means responsive to said emergency condition for operating said switch means.

4,371,904

FLEXIBLE MAGNETIC DISK SYSTEM

Raymond Brooke, Woodland Hills, Calif., assignor to Pertec Computer Corporation, Los Angeles, Calif.

Filed Aug. 22, 1980, Ser. No. 180,326

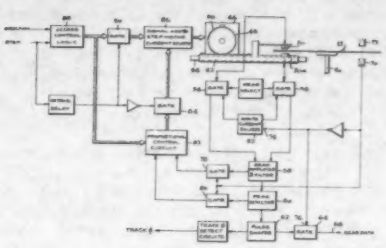
Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **8 Claims**

1. In a flexible disk drive system which includes a rotatable flexible disk and a disk having a read/write head mounted on a carriage to move radially along the rotating disk, the improvement wherein:

said disk defines a plurality of narrow positioning sectors angularly spaced about the disk, and a corresponding plurality of sector-indicating holes in the disk with each hole angularly spaced by the same amount from its corresponding positioning sector, each positioning sector defining a plurality of magnetically recorded positioning tracks;

said disk drive including optical sensor means positioned to detect said holes and head adjustment circuit means responsive to said optical sensor means and the output of said head for generating an error signal indicating the deviation of the head from a positioning track; and motor means responsive to said error signal for adjusting the radial position of said head.



4,371,905

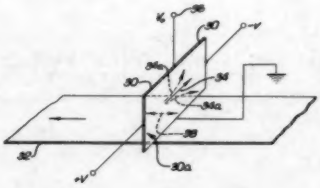
HIGH RESOLUTION HALL EFFECT READ HEAD

Erich P. Valstyn, Santa Barbara, and G. Vinson Kelley, Santa Monica, both of Calif., assignors to Computer & Communications Technology Corporation, Goleta, Calif.

Filed Nov. 13, 1980, Ser. No. 206,461

Int. Cl.³ G11B *5/38*

U.S. Cl. 360—112 **8 Claims**



1. A high resolution differential Hall effect head for reading information recorded on a magnetic recording medium, said head including no magnetic core elements and comprising at least one thin film Hall effect element which is oriented so that the film surface is perpendicular to and the film edge is parallel to the surface of the recording medium, means for biasing the Hall effect element so that it senses the component of the magnetic field of the recording medium which is parallel to the surface of the medium, said head including differential means for providing an output signal proportional to the difference between the magnetic field strength of the medium sensed at two points which are spaced a predetermined distance apart in the direction of travel of the medium.

4,371,906

OVERSPEED PROTECTIVE APPARATUS FOR A PORTABLE TOOL

Lorenzo E. Alessio, Lecco, and Giuseppe Cuneo, Caloiziocorte, both of Italy, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 18, 1980, Ser. No. 160,583

Claims priority, application Italy, Jun. 28, 1979, 23952 79

Int. Cl.³ H02H *1/00*

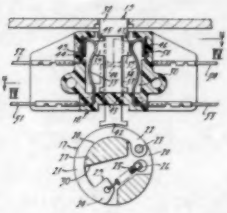
U.S. Cl. 361—51 **17 Claims**

1. A power tool, comprising:

an electric motor having at least one pair of stator windings electrically connected in parallel;

actuating means, coupled to said motor and responsive to the rotational speed thereof, for sensing an overspeed malfunction wherein the motor speed exceeds a predetermined maximum operating speed;

electrical switch means, connected in circuit with said stator windings and responsive to the sensing by said actuating means of an overspeed malfunction, for switching the electrical connection of said pair of stator windings from said parallel connection to a series connection to reduce



the motor speed to below said predetermined operating speed; and

means, associated with said electrical switch means, for rendering said switch means unactuatable once actuated so as to maintain said series connection of the stator windings until the power tool is dismantled for repair;

whereby the power tool can continue to be used by an operator at said reduced speed after the overspeed malfunction has occurred, but said switch means cannot be simply reset by the operator in disregard of the malfunction.

4,371,907

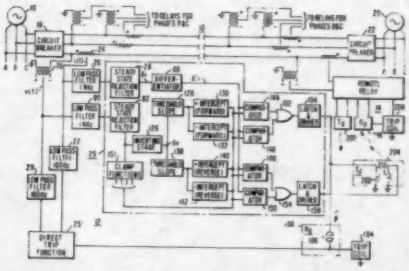
PROTECTIVE RELAY APPARATUS AND METHODS FOR PROTECTING ELECTRICAL POWER TRANSMISSION LINES

Allan M. Bignell, Mississauga, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

Filed Aug. 11, 1981, Ser. No. 291,745

Int. Cl.³ H02H 3/40

U.S. Cl. 361—82 **36 Claims**



1. A method of determining the direction to a fault from a measuring point on an A.C. electrical power transmission line, comprising the steps of:

providing a current derived signal which is a function of the fault generated current deviation from the steady pre-fault current as a function of time,

providing a voltage derived signal which is a function of the fault generated voltage deviation from the steady pre-fault voltage as a function of time,

transforming at least one of said signals such that the transformation results in the order of differentiation of the current derived signal being one order higher than the voltage derived signal, with the different order voltage and current derived signals being referred to as first and second signals, respectively,

and processing said first and second signals to provide an indication of the direction of the fault relative to the measuring point.

4,371,908

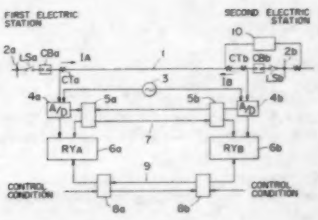
DIGITAL PROTECTIVE RELAYING SYSTEMS

Fumio Andow, Hachioji; Takayuki Kobayashi; Ryotaro Kondow, both of Fuchu, and Yoshiji Nii, Kawaguchi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 75,927, Sep. 17, 1979, abandoned. This application Feb. 3, 1982, Ser. No. 345,356

Int. Cl.³ H02H 3/30

U.S. Cl. 361—83 **5 Claims**



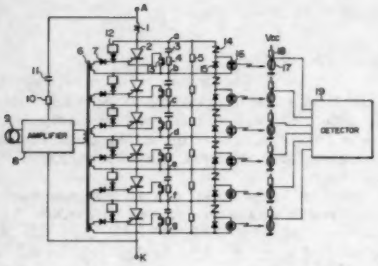
1. In a digital protective relaying device for protecting an electric power transmission system including an electric power transmission line having a first electric station and a second electric station at both ends thereof, each electric station including a circuit breaker, a disconnecting switch, a detector for detecting an electric value related to an input into the electric power transmission line, an A/D converter for converting an output of the detector into a digital value, a data transmitting and receiving terminal connected to receive the output of the A/D converter and to send the same to a data transmitting and receiving terminal in the other electric station through a data transmission line extending between the two data transmitting and receiving terminals, and a current differential protective relay connected to receive outputs of the two A/D converters for carrying out a relaying operation based on a vector sum of the two A/D converter outputs, one directly and the other through said data transmission line, the improvement wherein each current differential protective relay provided in said electric stations including a digital computer which, upon reception of a control condition from the other electric station, changes its data processing steps so as to neglect the output of said A/D converter in the other electric station and to operate the differential protective relay as an over-current protective relay solely according to the output of the A/D converter in the electric station receiving the control condition, said control condition representing one of tripping of the circuit breaker, opening of the disconnecting switch, and locking of the data transmitting and receiving terminal occurring in the other electric station.

4,371,909

HIGH VOLTAGE CONVERTER APPARATUS HAVING OVERVOLTAGE PROTECTION CIRCUITS FOR THYRISTORS

Takashi Kano, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 215,066
Claims priority, application Japan, Dec. 12, 1979, 54-160404
Int. Cl.³ H02H 3/20
U.S. Cl. 361—91 4 Claims



1. In a high voltage converter apparatus including a plurality of tray modules constituting one arm thereof, each tray module comprising:

a plurality of thyristors connected in series;

an ignition circuit for generating an ignition signal for said thyristors;

a pulse transformer having a primary winding and a plurality of secondary windings, said primary winding being connected to said ignition circuit and each of said secondary windings being connected between a gate and a cathode of a corresponding one of said thyristors;

a plurality of voltage dividing circuits, each of said voltage dividing circuits including an impedance element and being connected in parallel with a corresponding one of said thyristors;

a plurality of forward overvoltage protection circuits, each of said forward overvoltage protection circuits being connected between an anode and a gate of a corresponding one of said thyristors;

means, including a plurality of temperature relays each provided in a corresponding one of said voltage dividing circuits, for short-circuiting the gate-cathode path of the associated thyristor when the temperature of the corresponding impedance element included in each of said voltage dividing circuits exceeds a predetermined value;

a plurality of overvoltage detectors, each connected in parallel with a corresponding one of said thyristors and having a detection level which is lower than the operating voltage of said overvoltage protection circuit and higher than the shared voltage of each of said thyristors during its normal operation for detecting an overvoltage condition in the corresponding thyristor; and

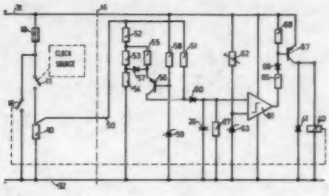
high level detector means for generating a stopping instruction signal under such a condition that all of said overvoltage detectors detect simultaneously an overvoltage condition a predetermined number of repetition times.

4,371,910

SAFETY DEVICE FOR ELECTRIC CONSUMERS IN MOTOR VEHICLES

Carsten Bube, Ludwigsburg; Ernst H. Düll, Darmstadt; Gerd Thiele, Stuttgart, and Hans Zeller, Grafenau, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 8, 1980, Ser. No. 166,925
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935196
Int. Cl.³ H02H 5/04
U.S. Cl. 361—106 4 Claims



1. Safety apparatus for an electric consumer in a motor vehicle which comprises:

temperature replication means, connected in parallel with the electric consumer, for generating an output signal corresponding to the temperature behavior of the electric consumer as a result of a flow of electric current through the electric consumer, which comprises a resistor-capacitor network;

electric power supply means for supplying current to the electric consumer and the temperature replication circuit;

a threshold switch, connected to receive the temperature replication means output signal, for generating an output signal whenever the temperature means output signal exceeds a maximum predetermined value; and

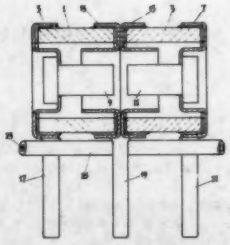
a switch means, connected in series with the electric consumer and activated to be opened by the threshold switch output signal, for interrupting the flow of current to the electric consumer and the temperature replication circuit from the electric power supply means.

4,371,911

EXCESS VOLTAGE ARRESTERS

Basil O. Baker, Hertfordshire, England, assignor to The M-O Valve Company Limited, London, England

Filed May 8, 1981, Ser. No. 261,946
Claims priority, application United Kingdom, May 16, 1980, 8016345
Int. Cl.³ H02H 7/24
U.S. Cl. 361—124 6 Claims



1. An excess voltage arrester comprising: a gas-filled enclosure; a pair of electrodes housed within the enclosure which define between them a discharge gap; respective rigid leads to

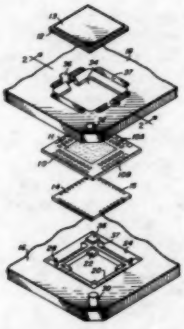
said electrodes; and an overheating protection device comprising a resilient electrically conductive first member in a flexed condition and a second member of heat softenable electrically insulating material associated with said first member so that on overheating of the arrester the second member softens allowing the first member to move in an attempt to return to its natural shape, and thereby establish an electrically conductive path through itself between the arrester electrodes, said first member being in the form of a length of wire whose natural shape is essentially straight and said second member being in the form of a sleeve on the wire, and said wire in its sleeve being held flexed between said rigid leads to the arrester electrodes so that a portion of said sleeve is trapped between said wire and a said lead, and so that on softening of the said sleeve said wire forces its way through said part of the sleeve into electrical contact with said lead.

4,371,912

METHOD OF MOUNTING INTERRELATED COMPONENTS

Andrzej T. Guzik, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1980, Ser. No. 192,771
Int. Cl.³ H05K *3/34, 1/18*
U.S. Cl. 361—417 **14 Claims**



1. A double-sided assembly as for electronic apparatus and comprising:

A single insulating substrate having two surfaces with a plurality of conductive paths on each surface and, in at least a central area, a plurality of through-holes with certain of the conductive paths extending through respectives ones of the holes;

a leadless chip carrier smaller in area than the substrate and having conductive areas on a carrier surface, said conductive areas being removably and conductively fused to certain of the conductive paths on one surface of the substrate;

a first electronic component smaller in area than the substrate and having conductive areas on a first component surface, said conductive areas being removably and conductively fused to conductive paths on the other surface of the substrate, said electronic component substantially overlying said leadless chip carrier; and

a plurality of leads, each conductively affixed to a respective one of the conductive paths on opposite surfaces of said substrate and adjacent at least one edge of the substrate.

11. A method of providing a double-sided assembly as for electronic apparatus including the steps of:

providing an insulating substrate having two surfaces;

providing through-holes in at least the central portion of the substrate;

providing a plurality of conductive paths on each surface of the substrate, including at least some paths on one surface of the substrate which continue through the central holes and onto the other surface of the substrate;

screening solder paste on selected portions of the conductive paths;

providing a first electronic component which is smaller in area than the substrate, and includes conductive paths terminating on a first component surface thereof;

providing a first fixture element having a first cavity for receiving and supporting the first electronic component, and a second cavity above the first cavity for receiving and supporting the substrate;

placing the first electronic component in the first cavity with the first component surface upward;

positioning the substrate in the second cavity;

providing a second electronic component which is smaller in area than the substrate and has conductive paths terminating on a second component surface thereof;

providing a second fixture element having a window therein for receiving the second electronic component;

positioning the second fixture element on the first fixture element;

placing the second electronic component in the window of the second fixture element with second component surface downward, completing a first assembly;

subjecting the completed first assembly to a temperature sufficient to reflow solder the conductive paths of the first and second components to the conductive paths of the substrate;

removing the soldered elements from the fixture;

mechanically attaching at least one lead frame to at least one edge of the substrate and in contact with some of the conductive paths;

providing a third fixture having sections which enclose the portion of the substrate bearing the two electronic components and expose the substrate portion bearing the lead frame;

positioning the reflow soldered assembly in the third fixture element; and

subjecting a portion of the fixture and assembly to flux and molten solder.

4,371,913

REFLECTOR LAMP MODULE FOR PHOTOFLASH ARRAY

David R. Broadt, Lewisburg, Pa., and Emery G. Audesse, Beverly, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1980, Ser. No. 217,721
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—17 **15 Claims**

1. In a multilamp photoflash unit, the combination comprising:

a reflector having a plurality of lamp-receiving cavities each having a planar rear wall section joined to a pair of oppositely disposed biplanar sidewall sections defining a front reflector opening width; and

a flashlamp having a tubular envelope disposed within each of said cavities with said envelope contiguous to said planar rear wall section and said oppositely disposed biplanar wall sections and said reflector opening width

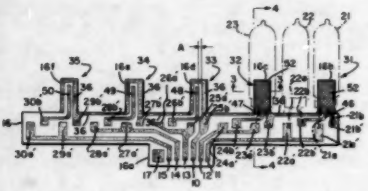
with respect to the lamp diameter being in a ratio of less than about 1.2 to 1.

4,371,914

PHOTOFLASH UNIT WITH CIRCUIT BOARD RADIATION SWITCHES FOR SELECTIVE PAIRING OF LAMPS

David R. Broadt, Lewisburg; Donald E. Armstrong, and Carl F. Kackenmeister, both of Williamsport, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1980, Ser. No. 217,722
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—15 **11 Claims**



1. A multilamp photoflash unit comprising, in combination:
a printed circuit board having electrically conductive circuit patterns disposed on a surface thereof;
a plurality of 2n flashlamps attached to said circuit board and disposed in a linear array with the longitudinal axes of respective lamps aligned in parallel, each of said lamps being electrically connected to respective portions of said circuit patterns;
said circuit board having a substantially rectangular portion with n spaced apart extensions projecting from a longer side thereof, said extensions being located behind alternate lamps of said linear array;
each of said circuit board extensions containing portions of said conductive circuit patterns spaced apart to form predetermined gaps therebetween; and
a mass of switch material disposed on each of said circuit board extensions and bridging said gaps between circuit patterns, thereby providing a solid state radiation switch on each of said extensions behind and adjacent to a respective lamp for receiving radiant energy emitted by that lamp.

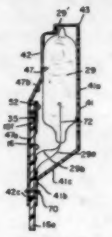
4,371,915

PHOTOFLASH UNIT WITH REFLECTOR RECESSES FOR CIRCUIT BOARD SWITCHES

David R. Broadt, Lewisburg, and Carl F. Kackenmeister, Williamsport, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1980, Ser. No. 217,723
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—15 **14 Claims**

1. A multilamp photoflash unit comprising, in combination:
a printed circuit board having electrically conductive circuit patterns disposed on a surface thereof;
a plurality of flashlamps attached to said circuit board and electrically connected to respective portions of said circuit patterns, each of said lamps having a tubular envelope;
said circuit board having a substantially rectangular portion with at least one extension projecting from a side thereof, said extension being located behind an associated one of said lamps with the plane of the extension being parallel with the longitudinal axis of the associated lamp;
said circuit board extension containing portions of said conductive circuit patterns spaced apart to form one or more predetermined gaps therebetween and a mass of switch material disposed thereon to bridge said gaps, thereby providing a solid state radiation switch on said extension behind and adjacent to said associated one of the lamps for receiving radiant energy emitted by that lamp;
means containing a plurality of lamp-receiving cavities, each of said cavities being provided with reflective surfaces on the interior thereof which define an opening in the front of the reflective cavity;



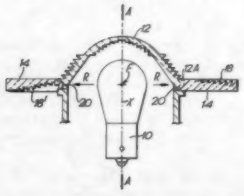
each of said flashlamps being nested in a respective one of said reflective cavities with the longitudinal axis of the lamp parallel to the longitudinal axis of the respective cavity; and
one of said reflective cavities having a rear wall with a recessed portion for accomodating said extension of the circuit board, said circuit board extension being disposed between the lamp associated therewith and the rear wall of said recessed portion of the reflective cavity.

4,371,916

MOTOR-VEHICLE LAMP WITH BASE AREA ILLUMINATION

Ennio De Martino, Turin, Italy, assignor to IAO Industrie Riunite S.p.A., Turin, Italy

Filed Oct. 19, 1979, Ser. No. 86,407
Claims priority, application Italy, Oct. 30, 1978, 69490 A/78
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—31 **1 Claim**



1. In a lamp for a motor vehicle of the type having a lamp bulb having a central axis concentrically surrounded by a convex prismatic cap and wherein the base portion of said cap is substantially coplanar with the central point of the light source within said lamp bulb, the improvement therewith comprising:
a transparent plate having a central circular aperture surrounding and being mechanically and optically coupled to said coplanar base portion of said cap, said plate including a plurality of prismatic elements comprising circular grooves concentrically surrounding said central axis of said lamp bulb wherein the radially directed luminous light flux emanating from said central point of said light source within said lamp bulb is collected and directed toward said prismatic elements in said plate and then directed forwardly away from the surface of said plate in directions which are parallel to the central axis of said lamp bulb, whereby said plate becomes luminous.

4,371,917
VOLTAGE CONVERSION METHOD

Tadeusz Bator, Spanga, Sweden, assignor to Wladimir Wladimiroff, Solna and Hans Andersson, Sandarne, both of, Sweden

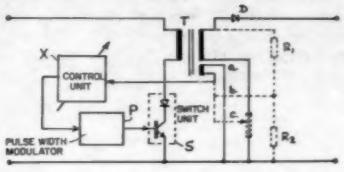
PCT No. PCT/SE80/00251, § 371 Date Jun. 16, 1981, § 102(e) Date Jun. 16, 1981, PCT Pub. No. WO81/01224, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 15, 1980, Ser. No. 276,384

Claims priority, application Sweden, Oct. 16, 1979, 7908554

Int. Cl.³ H02M *3/22*; H02P *13/18*

U.S. Cl. 363—21 **7 Claims**



1. A method of converting a d.c. voltage of a first level to another voltage level comprising:

chopping said d.c. voltage level to form a plurality of input voltage pulses with a pulse unit;

applying said plurality of voltage pulses to a primary winding of a transformer, said transformer having a secondary winding for delivering pulses for forming a shifted voltage level;

sensing a cyclical resonance voltage of said transformer windings; and

controlling the off time of said plurality of input voltage pulses to produce a resonance voltage of said transformer windings having a predetermined phase relationship with respect to said plurality of input voltage pulses corresponding to a minimum power loss.

4,371,918
HIGH EFFICIENCY PUSH-PULL SATURATION CONVERTER

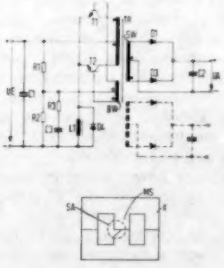
Rudolf Schierjott, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,940

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008887

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—22 **4 Claims**



1. A push-pull saturation converter, comprising: a transformer having a primary winding, a base winding, and a secondary winding; two switching transistors connected to alternately charge the primary circuit of the transformer with a DC voltage; bases of said switching transistors being linked via the common base winding of the primary circuit; a choke with a diode connected in parallel being disposed in a common emitter circuit of the switching transistors; and a center leg of a core of the transformer bearing the winding of the transformer having at least one notch-like shaping restricting a cross section of a center leg of the core.

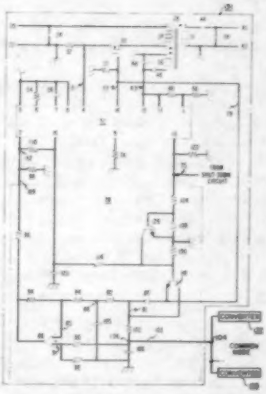
4,371,919
LOAD DISTRIBUTION AMONG PARALLEL DC-DC CONVERTERS

Michael W. Andrews, Whippany, and Carl J. Hoffmann, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1981, Ser. No. 258,679

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—65 **8 Claims**



1. Apparatus for distributing load currents evenly among a plurality of parallel converters each of said converters comprising

a primary side comprising a primary winding (**26**) and a switching transistor (**30**) said switching transistor being switched on by a variable width drive pulse supplied to the gate of said switching transistor,

a secondary side comprising a secondary winding (**34**), for generating an output voltage, a load circuit connectable to said secondary winding thereby drawing a load current,

means (**36**) on said primary side of each of said converters for sensing a voltage representative of said output voltage and said load current, said representative voltage being used to produce said variable width drive pulse,

said load current distributing apparatus

characterized by

means (**78**) for producing a first average value of said variable width drive pulses for each of said converters,

means (**104**) for producing a second average value of said first average values from all of said converters,

means (**86**) for comparing said first and second average values for each of said converters, and

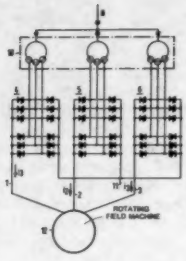
means in each of said converters (**50**) responsive to said comparison means (**50**) for varying the width of said drive pulses to said switching transistor (**30**).

4,371,920

POLYPHASE FREQUENCY CONVERTER WITH INDIVIDUALLY CURRENT-REGULATED OUTPUTS

Theodor Salzmann, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,997
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029320
Int. Cl.³ H02M 5/27
U.S. Cl. 363—160 3 Claims



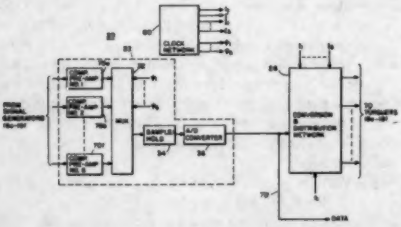
1. A circuit arrangement having a converter for supplying an m-phase load, the converter having *m* subconverters, each such subconverter having first and second AC voltage outputs, the first output of each subconverter being connected to a common converter neutral terminal, the arrangement further having a separate current regulator for impressing an output current with an integral signal component on each subconverter, each current regulator having inputs for respectively receiving a signal corresponding to the differnce between a reference value and an actual value of the subconverter output current, and an additional signal, the arrangement further comprising feedback resistor means for conducting the additional signal from the output of each current regulator to an input of the same current regulator.

4,371,921

INERTIAL INSTRUMENT WITH A TEMPORALLY DIGITIZED REBALANCE NETWORK

Glenn F. Cushman, Norfolk, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 922,818, Jul. 10, 1978, Pat. No. 4,200,925. This application Apr. 28, 1980, Ser. No. 144,256
The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.
Int. Cl.³ G06F 15/50
U.S. Cl. 364—138 5 Claims



1. In a digital rebalance loop inertial instrument having an inertial sensor for each of at least one rebalance loop, each sensor having an associated means for generating a position signal and having an associated torquer means for applying a torquer to said sensor in response to an applied torquer signal,

a rebalance network coupled to each said inertial sensor, said network comprising

digital torque correction means for generating a digital correction signal for each sensor comprising a succession of digital correction words, wherein each digital correction word in said succession is representative of the value of a torque signal to be applied to one of said sensor torquer means,

digital pulse width modulation means responsive to said succession of digital correction words for generating a corresponding succession of pulse width modulated, constant amplitude, digitally controlled, discretely timed torquer signals, and

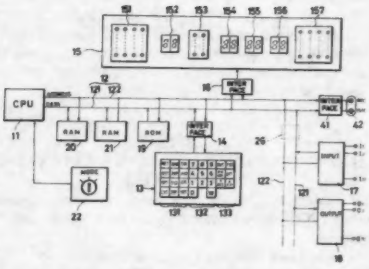
means for applying said torquer signals to each said respective sensor torquer means.

4,371,922

PROCESS STEPPING SEQUENTIAL CONTROLLER

Teizo Fujita, Ibarakishi; Hidetaka Dohmoto, Suitashi, and Shigeru Toyoda, Ujishi, all of Japan, assignors to Izumi Denki Corporation, Osaka, Japan

Filed Aug. 11, 1980, Ser. No. 177,355
Claims priority, application Japan, Aug. 21, 1979, 54-106872
Int. Cl.³ G06F 15/46, 9/00
U.S. Cl. 364—144 6 Claims



1. A process stepping sequential controller, which comprises:

a memory for programming which allows random writing thereto and reading out therefrom;

a process stepping counter for designating step numbers;

an input key for writing a program to said memory for programming, wherein said input key includes instruction keys, numeric keys and function keys;

a display unit for displaying an input from said input key and the items stored in said memory for programming, wherein said items include step number and the data stored for said step numbers;

said memory for programming including memory areas corresponding to each step of said process stepping counter, wherein each step area stores operation codes, codes representing the stepping condition of each program and output setting codes for commanding control in response to the satisfaction of said stepping condition;

said display unit including a representation of the type of said each operation and the content of data previously set with respect to each operation, wherein said representation is made in contrast; and

said process stepping counter proceeding to a subsequent specified process in response to the satisfaction of each stepping condition.

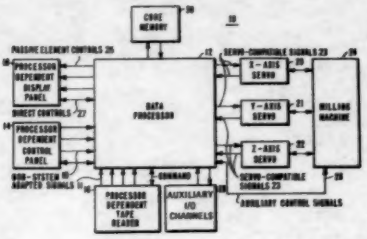
4,371,923
COMPUTER SYSTEM ARCHITECTURE

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation of Ser. No. 101,881, Dec. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 879,293, Nov. 24, 1969, abandoned. This application Dec. 14, 1977, Ser. No. 860,257

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 **3 Claims**



1. An integrated circuit data processor, said data processor including:

an integrated circuit read only main memory for storing a program, said main memory including a plurality of word locations assigned to a plurality of said main memory, each word location storing an instruction of said program

integrated circuit processing logic for processing input data in response to certain of said instructions of the program stored in said integrated circuit read main memory; and

integrated circuit read only main memory paging logic for selecting one of the plurality of pages of said main memory, said one selected page having included therein the word location of a certain instruction used in processing said data.

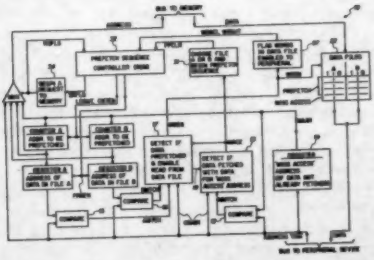
4,371,924
COMPUTER SYSTEM APPARATUS FOR PREFETCHING DATA REQUESTED BY A PERIPHERAL DEVICE FROM MEMORY

Marcus J. Schaefer, Plano, Tex., and George F. DeTar, Jr., Westminster, Colo., assignors to Rockwell International Corp., El Segundo, Calif.

Filed Nov. 9, 1979, Ser. No. 92,872

Int. Cl.³ G06F *7/00*

U.S. Cl. 364—200 **4 Claims**



1. In a computer system, wherein a device on a peripheral bus makes requests for data from a memory, the improvement comprising:

means for serially receiving from said bus multiple addresses from which the data is requested by the device;

means for making a determination from said received addresses that a plurality of said addresses received serially from the bus form a subsequence of the sequence of addresses in said memory;

means for requesting and receiving selected data from memory, including means, responsive to said determination, for prefetching data from a memory address anticipated to be received from the bus as an extension of said subsequence, without waiting for said anticipated address to be received from the bus;

a data file;

means for storing data requested and received from said memory in said data file;

means for examining one of said serially received addresses to determine whether data from said examined address has been previously requested from said memory and received;

means responsive to said examining means for transferring, to the bus from the data file, data previously requested and received from the examined address; and

means for determining when sufficient storage space becomes available in the data file to receive a further entry of data from said memory, and thereupon initiating said prefetching of data from said memory to fill the space which has become available.

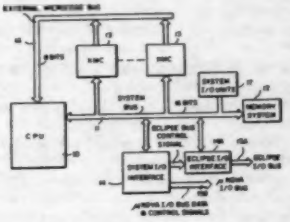
4,371,925
DATA PROCESSING SYSTEM HAVING UNIQUE BUS CONTROL OPERATION

Richard A. Carberry, Cupertino, Calif.; Michael B. Druke, Chelmsford, and Ronald I. Gusowski, Westboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 11, 1980, Ser. No. 120,271

Int. Cl.³ G06F *13/00, 3/04*

U.S. Cl. 364—200 **17 Claims**



8. In a digital data system having a plurality of system units connected to a common bus, bus means for controlling access to said common bus, comprising:

means for generating two separate bus clock signals identifying a first time phase and a second time phase, respectively, and

bus interface means in each one of said system units, said bus interface means of each one of said system units including

means responsive to a bus clock signal during said first time phase for (1) providing on said bus a first word identifying (a) an operation requested by said one of said system units and (b) another one of said system units requested to perform said operation and for (2) generating a first signal indicating that said first word is present on said bus, said first signal generating means, in response to the presence of said second time phase, being inhibited from generating said first signal during said second time phase;

means in other system units responsive to the presence of said first signal for inhibiting the placement of data on said common bus;

means at said one of said system units responsive to a bus clock signal during said second phase, and to a previous said first word requesting said operation to be performed by said another one of said system units, for (1) providing on said bus a second word for controlling the performance

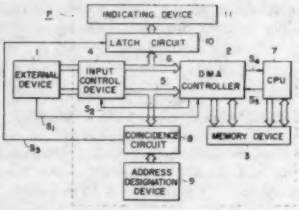
of said operation and for (2) generating a second signal indicating that said second word is present on said bus; and

means in other system units responsive to the presence of said second signal for inhibiting the placement of a said first word on said common bus.

4,371,926
INPUT/OUTPUT INFORMATION INDICATION SYSTEM

Mitsuru Yamaura, Hachioji; Ryotaro Kondow, Tokyo; Junichi Inagaki, Fuchu, and Eiichi Okamoto, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1980, Ser. No. 127,844
Claims priority, application Japan, Mar. 9, 1979, 54-26777
Int. Cl.[3] G06F *11/32*
U.S. Cl. 364—200 **4 Claims**



1. An input/output information indication system for a data processing system in which information transfer between an external device and a memory device coupled to a central processing unit is controlled by direct memory access, said data processing system including the central processing unit, the memory device, an input control device, a direct memory access controller for exercising direct memory access control over said memory device, and a bus system coupling the central processing unit and the memory device said bus system further coupling the direct memory access controller and the memory device another bus system including an address bus and a data bus coupling said direct memory access controller and the external device via the input control device, said direct memory access controller in response to a control signal transferring between the direct memory access controller and the central processing unit transferring an address and data, respectively, constituting input/output information between the memory device and the external device via the input control device independently of the operation of the central processing unit when said memory device is under direct memory access control of said direct memory access controller, said input-/output information indication system comprising:

an address designation device for designating an address which corresponds to a memory location in the memory device when said memory device is under direct memory access control;

a coincidence circuit coupled to said address designation device for receiving said designated address therefrom and coupled to said address bus for receiving addresses corresponding to memory locations in the memory device appearing on said address bus when the memory device is under direct memory access control, and producing a coincidence signal when the address from said address designation device and an address present on said address bus coincide;

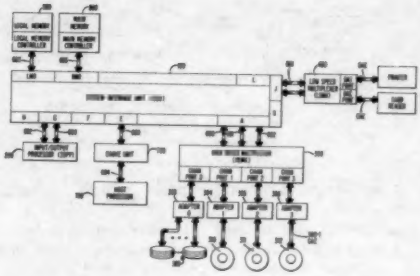
a latch circuit coupled to said coincidence circuit and said data bus for latching the data appearing on said data bus when said latch circuit receives the coincidence signal; and

an indicating device coupled to said latch circuit to receive latched data therefrom and indicate the same.

4,371,927
DATA PROCESSING SYSTEM PROGRAMMABLE PRE-READ CAPABILITY

John E. Wilhite, Glendale; William A. Shelly, and Charles P. Ryan, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 853,944, Nov. 22, 1977, abandoned. This application Mar. 20, 1980, Ser. No. 131,739
Int. Cl.[3] G06F *9/28*
U.S. Cl. 364—200 **36 Claims**



1. A data processing system comprising:

an addressable main store having a plurality of word locations for storing information including data and instructions;

high speed buffer storage means coupled to said main store for providing immediate access to data and instructions fetched from said main store and stored therein, said buffer storage means having a plurality of addressable locations, and said buffer storage means including control means for fetching said information from said main store in response to memory commands; and,

processing means coupled to said high speed buffer storage means, said processing means for processing a normal repertoire of instructions, each instruction including an operation code portion and a plurality of descriptor address portions, said processing means including control means for generating signals including said memory commands required for the execution of said instructions, said control means including decoder circuit means in response to signals indicative of said operation code portion of each type of instruction within said normal repertoire coded to specify an operation involving a plurality of operand data strings specified by said plurality of descriptor address portions which can be processed concurrently, being operation to generate memory command signals accompanied by a set of coded command signals specifying fetching in advance a predetermined segment of data of a first operand string specified by an address developed from a first one of said plurality of instruction descriptor address portions and

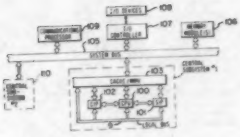
said buffer storage control means being operative in response to said set of coded command signals to generate signals for forwarding said memory command to said main store to fetch said segment of data when said predetermined segment specified by said memory command is not stored in said buffer storage means for storage in advance in said buffer storage means and enabling signals for conditioning said processing control means to continue to process another one of said plurality of descriptor address portions of said each type of instruction thereby increasing the efficiency of executing said each predetermined type of instruction.

4,371,928

INTERFACE FOR CONTROLLING INFORMATION TRANSFERS BETWEEN MAIN DATA PROCESSING SYSTEMS UNITS AND A CENTRAL SUBSYSTEM

George J. Barlow, Tewksbury; Philip E. Stanley, Westboro, and Richard P. Brown, Acton, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,623
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 11 Claims



1. A data processing system comprising:

a system bus having a system data transfer path of a first bit width for the bidirectional transfer of data, control signals, and response signals;

a memory module subsystem comprising:

a first memory module having a unique identifier associated therewith and including a data path of said first bit width coupled to said system data transfer path, said first memory module for storing data in a plurality of memory locations, for performing data transfers with said system data transfer path through said first data path, and for generating response signals indicating the performance of a said data transfer by said first memory module;

a second memory module having a unique identifier associated therewith and including a second data path of a second bit width less than said first bit width coupled to said system data transfer path, said second memory module for storing data in a plurality of memory locations, for performing data transfers with said system data transfer path through said second data path, and for generating response signals indicating the performance of a said data transfer said by second memory module;

a central subsystem including subsystem processing means for supplying to said system bus for transmission to said first data path or said second data path original data transfers of said first bit width, each of said original data transfers including said identifier of said first memory module or said identifier of said second memory module; and

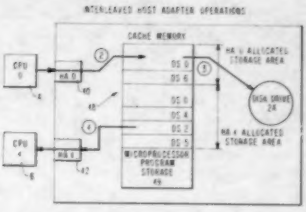
interface means for receiving said response signals generated by said memory module associated with said transferred identifier in response to a said original data transfer and for initiating additional data transfers when said received response signals indicate that said original data transfer had been made to said second memory module, said additional data transfers to enable the cumulative transfer of a number of data bits equal to said second bit width from said subsystem processing means to said second memory module.

4,371,929

MULTIPROCESSOR SYSTEM WITH HIGH DENSITY MEMORY SET ARCHITECTURE INCLUDING PARTITIONABLE CACHE STORE INTERFACE TO SHARED DISK DRIVE MEMORY

John J. Brann, Manassas, Va.; Charles S. Freer, Jr., Westminster, Md., and Warren W. Jensen, Warrenton, Va., assignors to IBM Corporation, Armonk, N.Y.

Filed May 5, 1980, Ser. No. 146,897
Int. Cl.³ G06F *13/00, 13/04, 13/08, 9/00*
U.S. Cl. 364—200 12 Claims



1. In a multiprocessing system, a partitionable cache store interface to a shared disk drive memory, comprising:

a cache storage memory having a data input and output connected to a data bus communicating in common with a plurality of distributed processors and with said disk drive memory, for storing data sets for each of said processors in mutually exclusive partitions;

a direct memory access (DMA) controller having a control line connected to each of said processors and to said disk drive memory, for receiving bus allocation demands from said processors and allocating time divided access for selected ones of said processors to said data bus for transferring data to or from corresponding ones of said partitions in said cache storage memory;

word counter in said DMA controller having an input connected to a selected processor, for counting the quantity of data stored in the corresponding partition of said cache storage memory and initiating a bus allocation demand for said disk drive memory to obtain time divided access to said data bus for transferring data from said corresponding partition to said disk drive memory;

whereby data can be transferred between said plurality of processors and said cache memory and between said cache memory and said disk drive memory on a time divided basis.

4,371,930

APPARATUS FOR DETECTING, CORRECTING AND LOGGING SINGLE BIT MEMORY READ ERRORS

Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 3, 1980, Ser. No. 156,113
Int. Cl.³ G06F *11/10*; G11C *29/00*
U.S. Cl. 364—200 8 Claims

1. In a data processing system, the combination comprising:

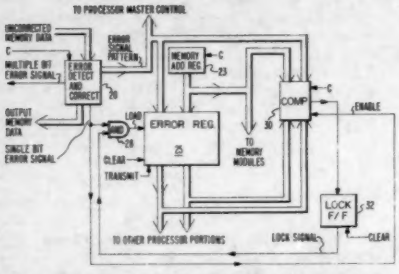
selectively addressable storage means including a plurality of memories;

addressing means for addressing a said memory to read out selected memory data therefrom, said selected memory data including a plurality of check bits chosen so as to permit determining whether at least a single bit error is present in the selected memory data;

local error detection and correction means, one for each memory, for detecting and correcting single bit memory read errors in selected memory data read from its respective memory in response to said check bits included therein and for automatically restoring corrected memory

data back into the respective memory address whenever a single bit memory read error is detected;

common error detection and correction means to which data read from each memory is applied without correction by its respective local error detection and correction means, said common error detection and correction means being operative in response to the check bits included in each selected memory data applied thereto to detect and correct single bit errors and to provide a single bit error signal each time a single bit error is detected in applied memory



data along with a corresponding error signal pattern indicating the incorrect bit; and

selective error determining means constructed and arranged to operate in response to said single bit error signal, said addressing means, and said error signal pattern for indicating when a detected single bit error in data read from a memory is likely to be hardware related by determining whether this same error has been consecutively detected a predetermined plurality of times for the same memory area.

4,371,931

LINEAR MICRO-SEQUENCER FOR MICRO-PROCESSOR SYSTEM UTILIZING SPECIALIZED INSTRUCTION FORMAT

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 52,350, Jun. 27, 1979, Pat. No. 4,291,372. This application Mar. 5, 1981, Ser. No. 240,880

Int. Cl.³ G06F *3/04, 9/30, 13/00, 9/00*

U.S. Cl. 364—200 **9 Claims**

1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory and communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an Arithmetic Logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

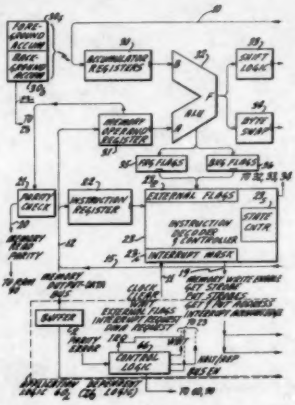
(a2) said shift logic circuit providing output to an I/O bus, said shift logic circuit functioning to rotate one or more bits of a word being processed to the right or to the left;

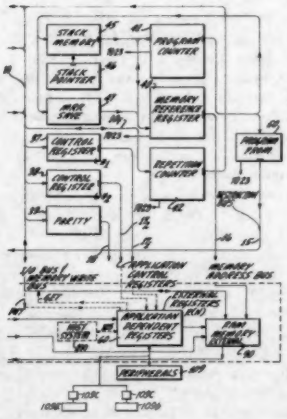
(a3) said byte-swap circuit providing output to said I/O bus, said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connection lines from said data processing means to said external register means, to said external memory, to an accumulator register means, and to an addressing means;

(c) said addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an internal memory or said external memory, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;





(c2) a memory reference register connected to said decoder-controller for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to the said external memory;

(c2-2) and wherein a dedicated nonaddress bit (byte-select bit) in said memory reference register being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) an address register in said decoder-controller connecting by means of an address bus to an accumulator register means, which include a plurality of accumulator registers, for selection of an addressed accumulator register as a destination or as a source of data;

(d) said internal program memory for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory operand register;

(e) register means for temporary storage of data, said register means including:

(e1) said plurality of addressable accumulator registers which provide an output to the input of said Arithmetic Logic Unit, said accumulator registers receiving input data words from said I/O bus;

(e2) said memory operand register for receiving operand data from said internal program memory via said instruction bus or from said external memory via an external memory data bus;

(e3) said instruction register for receiving instruction words from said internal program memory via said instruction bus and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means;

(f1) and wherein said decoder-controller further includes:

(f1o) linear sequencing means for selecting microinstructions for execution in a predetermined sequence said sequencing means including a microinstruction memory for storing microinstructions, said linear sequencing means including:

(f1o-1) a state counter connected to said microcode instruction memory for receiving count control signals from said microcode instruction memory, and for providing a first portion of address signals to said microcode instruction memory;

(f1o-2) input control lines from said instruction register to provide a second portion of address signals to said microcode instruction memory;

(f1o-3) and wherein said microcode instruction memory provides said microcode instructions for the output lines of said decoder-controller in response to said first and second address portions;

(f1a) connection means for receiving control signals from said control logic in said application-dependent logic module;

(f1b) address lines to said external register means for selecting a specific register;

(f1c) control lines for strobing address signals to said external register means;

(f1d) circuitry responsive to each data field of an instruction for executing the requirements of each of said data fields;

(g) said external memory data bus for carrying data from said external memory to said instruction register and said memory operand register;

(h) an instruction word format in said internal program memory which includes:

(h1) a basic function instruction field for initiating transfer of the contents of a selected register to another selected register or for selecting an Arithmetic Logic Unit operator or a program stack operator;

(h2) a variant function field for initiating selection of:

(i) an addressed external register for a GET operation or a PUT operation;

(ii) a particular function to be performed by said Arithmetic Logic Unit;

(iii) a condition test or program stack operator;

(h3) a destination field for:

(i) placement of data resulting from GET and Arithmetic Logic Unit operators;

(ii) placement of data resulting from PUT and Program Stack operators;

(h4) a source field for initiating selection of data for:

(i) an Arithmetic Logic Unit or PUT operation;

(ii) a GET operation;

(iii) a Program Stack operation;

(h5) a bit field for parity information;

(h6) a single bit field "M" for signaling said decoder-controller to select either said program counter or said memory reference register as an address source for operands of the current instruction;

(h7) a single bit field "C" for signaling said decoder-controller to initiate or not initiate the said Arithmetic Logic Unit to copy its output into said memory reference register.

4,371,932

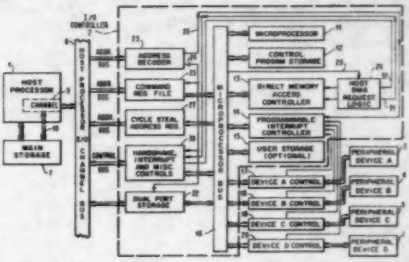
I/O CONTROLLER FOR TRANSFERRING DATA BETWEEN A HOST PROCESSOR AND MULTIPLE I/O UNITS

John M. Dinwiddie, Jr., Loxahatchee; Bobby J. Freeman, Boynton Beach; Timothy Jackson, Coral Springs, all of Fla., and William L. Zipoy, Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 62,263, Jul. 30, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 325,151

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **12 Claims**



1. An I/O controller for transferring data between an I/O unit and a host processor having a main storage unit and comprising:

a random access controller storage unit located in the I/O controller for storing data;

first selectively operable data transfer circuitry for providing a data transfer path between the host processor and the controller storage unit;

second selectively operable data transfer circuitry for providing a data transfer path between the controller storage unit and the I/O unit;

first storage accessing circuitry for supplying addresses to the controller storage unit and selection signals to the second data transfer circuitry for enabling the transfer of data between the controller storage unit and the I/O unit;

cycle steal storage accessing circuitry for supplying host processor main storage addresses to the host processor, controller storage addresses to the controller storage unit and selection signals to the first data transfer circuitry for enabling the transfer of data words between the host processor and the controller storage unit in a cycle steal data transfer mode wherein a plurality of data words are automatically transferred by the I/O controller without need for individual word I/O commands from the host processor;

direct command storage accessing circuitry responsive to

addresses received from the host processor for supplying addresses to the controller storage unit and selection signals to the first data transfer circuitry for enabling the transfer of data words between the host processor and the controller storage unit in a direct command data transfer mode wherein one data word is transferred for each I/O command issued by the host processor;

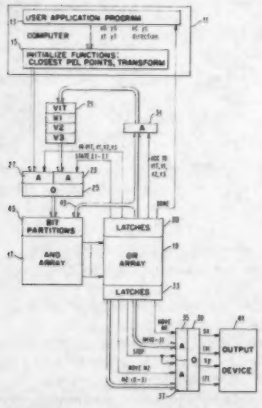
and interleaving control circuitry coupled to the second and third storage accessing circuitry for enabling the transfer of a data word to be transferred in the direct command data transfer mode to be interleaved between the transfer of two data words being transferred in the cycle steal data transfer mode.

4,371,933

BI-DIRECTIONAL DISPLAY OF CIRCULAR ARCS

Jack E. Bresenham, Chapel Hill, N.C.; Donald G. Grice, Kingston, and Shing-Chou Pi, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,522
Int. Cl.³ G06F *15/31, 3/153*
U.S. Cl. 364—300 **6 Claims**



1. A graphic output system for creating a portion of a circular arc on an incremental Cartesian coordinate output device comprising:

a computer for establishing initialization parameters from specifications of a circular arc supplied by a graphic application program;

logic for testing an octant transition count for a termination octant;

logic for testing for an end point in said termination octant;

logic for testing for an octant boundary;

logic to reinitialize at least some of said intial parameters at each octant boundary;

logic for selecting a unit direction for an incremental output movement;

logic for modifying at least some of said initial parameters;

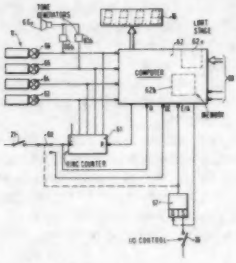
and output means for moving in said selected unit direction.

4,371,934

VEHICLE TRIP COMPUTER

Josef Wahl, Stuttgart; Peter-Jürgen Schmidt, Schwieberdingen; Jörg Birmelin, Bretten; Ferdinand Grob, Besigheim; Rolf Kohler, Trossingen; Erich Zabler, Karlsruhe; Frieder Heintz, Stutensee; Wolfgang Bremer; Viktor Köpernick, both of Ettlingen; Robert Hugel, Stutensee-Friedrichsthal; Andreas Weigl, Ettlingen, and Günther Baumann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 140,797
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917957; Jan. 17, 1980, 3001470
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—424 **25 Claims**



1. In combination with an automotive vehicle,

a vehicle trip computer having

an optical display device (**10, 41**) for indicating and presenting data, including

a numerical display device (**16**) for the display of numerical values and

a plurality of display fields, each characterizing and identifying the significance or import of the displayed numerical value, on said numerical display device;

an operating component (**20, 50**) for entry and/or retrieval of data including a plurality of keys (**20–25**);

a data supply computer (**62**) furnishing a plurality of numerical values, representative of operating parameters and information data relative to at least the then existing operation of the vehicle;

the display fields being adjacently positioned and located in groups or sets (**11–15; 42–45**);

one key (**21–25**), each, being assigned to each group or set;

counter means (**61**) connected to the keys and counting the number of times a key is operated, each key operation being associated with a selected operating parameter relative to at least the then existing operation of the vehicle, or a selected significant information item;

signal transmission link means connecting respective ones of the count output of the counter means to

(a) the data supply computer to provide outputs for display on the display device (**16**) of numerical values pertaining to the selected operating parameter of the selected significant information item, and

(b) to respective display fields of the group, or set, associated with a respective count to sequentially switch display of a specific display field in the display fields in the group, or set, upon repeated operation of a single key,

whereby the optical display device will display

(a) on the numerical display device, a numerical value representative of the selected operating parameter, or information item selected by a respective key and the respective number of operations of the key, and

(b) on the display fields, a representation of the parameter, or the significance of the information item being shown in form of a numerical value on the numerical display device (**16**) upon operation of only a single key; and wherein

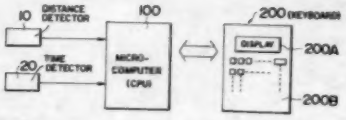
the groups or sets (11–15; 42–45) of the display fields are disposed in a predetermined geometric layout:

and the keys (21–25) associated with the sets or groups of said display fields are located in a layout having a similar geometric configuration.

4,371,935
NAVIGATION INSTRUMENT

Kiyoshi Yamaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 58,770, Jul. 19, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,237
Claims priority, application Japan, Sep. 29, 1978, 53-119963
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—424 **18 Claims**



1. A navigation instrument for use with a roadway vehicle, comprising:

(a) distance detector means for providing a signal representative of the distance of travel of the vehicle from a starting point;

(b) time detector means for providing a signal representative of the length of time it takes the vehicle to travel said distance;

(c) speed setting means for providing a signal representative of a scheduled average speed;

(d) arithmetic means responsive to said vehicle travelling distance and time representative signals and said scheduled average speed representative signal for providing three data signals representative of the average speed of the vehicle, the deviation of travelling distance from a scheduled one, and the deviation of the travelling time from a scheduled one;

(e) signal generator means for providing a data-unavailability indicative signal;

(f) control means responsive to said vehicle travelling distance representative signal from said distance detector for providing a first control signal when the vehicle travelling distance is shorter than a predetermined level and a second control signal when it is longer than said predetermined level;

(g) signal selector means responsive to said first control signal for passing said data-unavailability indicative signal and responsive to said second control signal for sequentially passing said data signals fed thereto from said arithmetic means; and

(h) display means responsive to each signal applied thereto from said signal selector means for displaying the content represented by the signal.

4,371,936
ATTITUDE TRIMMED AIRSPEED/ATTITUDE CONTROLS

Don L. Adams, Fairfield; William C. Fischer, Monroe; Stuart C. Wright, Milford, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,267
Int. Cl.³ G06F *15/50*; **B64C** *11/00*
U.S. Cl. 364—434 **3 Claims**

1. A system for positioning pitch-attitude-controlling aerodynamic surfaces of an aircraft, comprising:

control means responsive to force applied by a pilot to position said aerodynamic surfaces;

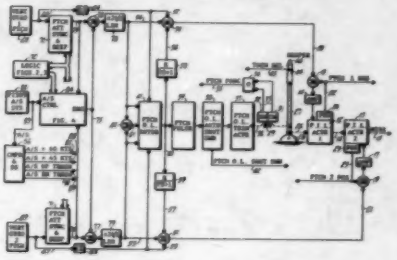
actuator means selectively engageable to said control means responsive to a command input signal applied thereto for positioning said control means;

trim release means selectively operable by the pilot of the aircraft to disengage said actuator means from said control means and for providing a trim release signal indicative thereof;

pitch attitude means for providing an attitude signal indicative of the actual attitude of the aircraft in its pitch axis;

airspeed means for providing an airspeed signal indicative of actual aircraft airspeed; and

signal processing means, responsive to said pitch attitude means, said airspeed means, and said trim release means for providing, during the presence of said trim release signal, an attitude reference signal indicative of the attitude desired for the aircraft in said pitch axis in response to said actual attitude signal, for providing an airspeed reference signal indicative of a desired airspeed for the aircraft, for selectively providing an airspeed engage signal indicative of the fact that control of said actuator means includes



commands for attaining said desired airspeed, for providing an attitude error signal indicative of the difference between said attitude reference signal and said actual attitude signal, for providing an airspeed error signal indicative of the difference between said airspeed signal and said airspeed reference signal, for alternatively providing to said actuator means a pitch attitude command signal indicative of a desired change in aircraft pitch attitude in response to said attitude error signal when said airspeed engage signal is not present, or in response to both said attitude error signal and said airspeed error signal when said airspeed engage signal is present;

characterized by said signal processing means comprising means responsive to said trim release signal for providing said attitude reference signal substantially identical to said actual attitude signal and for providing said airspeed reference signal substantially identical to said airspeed signal during the presence of said trim release signal and for a predetermined period of time following termination of said trim release signal.

4,371,937
RETAINING AIRSPEED HOLD ENGAGEMENT IN LOW SPEED MANEUVER

Don L. Adams, Fairfield; William C. Fischer, Monroe; Stuart C. Wright, Milford, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,268
Int. Cl.³ G06F *15/50*; **B64C** *11/00*
U.S. Cl. 364—434 **2 Claims**

1. A system for positioning pitch-attitude-controlling aerodynamic surfaces of an aircraft, comprising:

control means responsive to force applied by a pilot to position said aerodynamic surfaces;

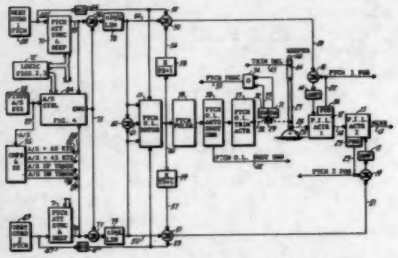
means responsive to said control means for providing a force signal indicative of the pilot applying force to said control means;

pitch attitude means for providing an attitude signal indicative of the actual attitude of the aircraft in its pitch axis;

airspeed means for providing an airspeed signal indicative of actual aircraft airspeed;

actuator means responsive to a command input signal applied thereto for positioning said aerodynamic surfaces; and

signal processing means, responsive to said pitch attitude means and said airspeed means, for providing a pitch reference signal indicative of the pitch attitude desired for the aircraft, for providing an airspeed reference signal indicative of a desired airspeed for the aircraft, for selectively providing an airspeed engage signal indicative of the fact that control of said actuator means includes commands for attaining said desired airspeed, for providing an attitude error signal indicative of the difference between said pitch reference signal and said actual attitude signal, for providing an airspeed error signal indicative of the



difference between said airspeed signal and said airspeed reference signal, for alternatively providing to said actuator means a pitch attitude command signal indicative of a desired change in aircraft pitch attitude in response to said attitude error signal when said airspeed engage signal is not present, or in response to both said attitude error signal and said airspeed error signal when said airspeed engage signal is present;

characterized by said signal processing means comprising means for providing said airspeed engage signal in response to said airspeed signal indicating an airspeed in excess of a predetermined threshold magnitude, and for thereafter continuing to provide said airspeed engage signal even if said airspeed signal indicates an airspeed less than said predetermined magnitude in concurrent response to the presence of said airspeed engage signal and said force signal so long as said airspeed error signal is in excess of a predetermined magnitude.

4,371,938

AUTOMATIC AIRSPEED ENGAGE/DISENGAGE

Stuart C. Wright, Milford; Don L. Adams, Fairfield; William C. Fischer, Monroe, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,269
Int. Cl.[3] G06F *15/50*; B64C *11/00*
U.S. Cl. 364—434 **4 Claims**

1. A system for positioning pitch-attitude-controlling aerodynamic surfaces of an aircraft, comprising:

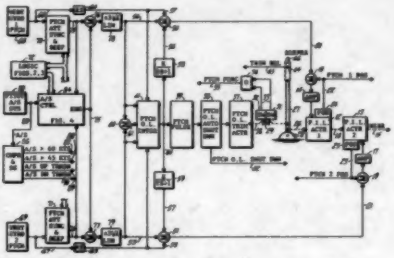
control means responsive to force applied by a pilot to position said aerodynamic surfaces;

pitch attitude means for providing an attitude signal indicative of the actual attitude of the aircraft in its pitch axis;

airspeed means for providing an airspeed signal indicative of actual aircraft airspeed;

actuator means responsive to a command input signal applied thereto for positioning said aerodynamic surfaces; and

signal processing means, responsive to said pitch attitude means and said airspeed means, for providing a pitch reference signal indicative of the pitch attitude desired for the aircraft, for providing an airspeed reference signal indicative of a desired airspeed for the aircraft, for selectively providing an airspeed engage signal indicative of the fact that control of said actuator means includes commands for attaining said desired airspeed, for providing an attitude error signal indicative of the difference between said pitch reference signal and said actual attitude signal, for providing an airspeed error signal indicative of the difference between said airspeed signal and said airspeed reference signal, for alternatively providing to said actuator means a pitch attitude command signal indicative of a desired change in aircraft pitch attitude in response to said attitude



error signal when said airspeed engage signal is not present, or in response to both said attitude error signal and said airspeed error signal when said airspeed engage signal is present;

characterized by said signal processing means comprising means for providing said airspeed engage signal in response to said airspeed signal indicating an airspeed in excess of a predetermined threshold magnitude, and for thereafter continuing to provide said airspeed engage signal even if said airspeed signal indicates an airspeed less than said predetermined magnitude in concurrent response to the presence of said airspeed engage signal and said pitch attitude command signal indicating a desired change in aircraft pitch attitude in excess of a preestablished magnitude.

4,371,939

ROLL ATTITUDE INHIBIT OF AIRCRAFT COORDINATED TURN DISENGAGEMENT

Don L. Adams, Fairfield; William C. Fischer, Monroe; Stuart C. Wright, Milford, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,271
Int. Cl.[3] G06F *15/50*; B64C *11/00*
U.S. Cl. 364—434 **2 Claims**

1. An aircraft automatic flight control system, comprising:

yaw means for providing a yaw rate signal indicative of rate of rotation of the aircraft about its yaw axis;

directional gyro means for providing a heading error signal indicative of the deviation of aircraft heading from a desired heading;

roll rate means for providing a roll rate signal indicative of the rate of rotation of the aircraft about its roll axis;

acceleration means for providing a lateral acceleration signal indicative of lateral acceleration of the aircraft;

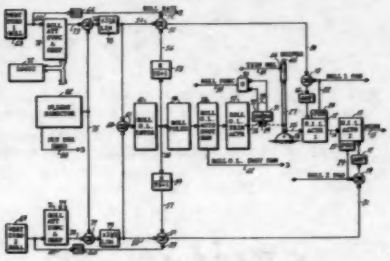
airspeed means providing an airspeed signal indicative of the aircraft having in excess of a threshold speed;

heading hold means having two states and operable in a first one of said states to indicate a heading mode of operation, said means being selectively settable by the pilot of the aircraft into the second one of said states;

means for providing a flight director engaged signal indicative of engagement of an automatic roll steering function of the automatic flight control system;

yaw trim actuator means for positioning the yaw-axis-controlling aerodynamic surfaces of the aircraft in response to yaw command signals applied thereto; and

signal processing means responsive to said yaw means, said directional gyro means, said roll means, said acceleration means, and said pilot operable means, for providing a heading hold mode signal in response to said heading hold means being in said first state, for providing heading hold yaw command signals to said actuator means as a function of said yaw rate signal and said heading error signal in the



presence of said heading hold mode signal and for providing turn coordinating yaw command signals as a function of said roll rate signal and said lateral acceleration signal in response to the presence of said airspeed signal concurrently with the absence of said heading hold mode signal;

characterized by said signal processing means comprising means for providing said heading hold mode signal in response to said heading hold means being in said first state concurrently with the absence of said flight director engaged signal, whereby said signal processing means provides said turn coordinating yaw command signals in the presence of said flight director engage signal concurrently with said airspeed signal.

4,371,940

NAVIGATION INSTRUMENT

Kiyoshi Yamaki, Yokohama; Masanori Mizote; Hitoshi Takeda, both of Yokosuka; Hidetaka Suzuki, Yokohama; Hiroyuki Nomura, Fujisawa; Teruo Kawasaki, and Kazuyuki Mori, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 158,822, Jun. 12, 1980, abandoned.
This application Jul. 30, 1981, Ser. No. 288,453
Claims priority, application Japan, Jun. 14, 1979, 54-75457
Int. Cl.³ G01C *21/20, 23/00*
U.S. Cl. 364—444 **20 Claims**

1. In a navigation instrument for use with a road way vehicle, comprising:

(a) distance detector means producing a signal showing the distance of travel of the vehicle from a starting point;

(b) time detector means producing a signal showing the length of time it takes the vehicle to travel said distance;

(c) speed setting means producing a signal showing a scheduled average speed;

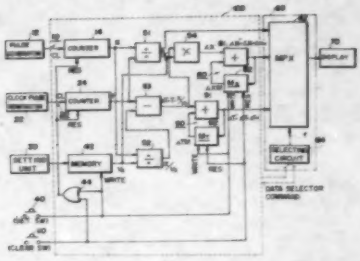
(d) arithmetic means responsive to said vehicle travelling distance and time showing signals and said scheduled average speed showing signal, and producing three data signals showing the average speed of the vehicle, the deviation of the travelling distance from a scheduled one, and the deviation of the travelling time from a scheduled one;

(e) signal selector means responsive to a data selector command from said arithmetic means, and sequentially outputting one of said three data signals from said arithmetic means;

(f) display means responsive to each signal applied thereto from said signal selector means for displaying the content represented by the signal,

the improvement wherein said arithmetic means includes

(i) travelling distance deviation accumulating means for adding the deviation of the travelling distance with respect to the average speed initially set by said setting means to the deviations of the travelling distance when-



ever said average speed is altered, and means for feeding data showing the accumulated deviation of the travelling distance to said display means through said signal selector means; and

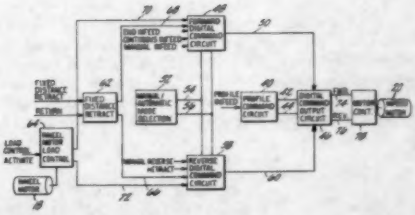
(ii) travelling time deviation accumulating means for adding the deviation of the travelling time with respect to the average speed initially set by said setting unit to the deviations of the travelling time whenever said average speed is altered, and means for feeding data showing the accumulated deviation of the travelling time to said display means through said signal selector means.

4,371,941

CONTROL APPARATUS FOR ROLL GRINDERS

Ronald J. Gordiski, Ansonia; Robert G. Bennett, Jr., Seymour; Alfred T. Parrella, Newtown, and Michael Bagnall, Southbury, all of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 31, 1979, Ser. No. 108,338
Int. Cl.³ G05B *19/18;* **G06F** *15/46*
U.S. Cl. 364—475 **46 Claims**



1. In a roll grinding machine, a system for controlling the infeed positioning of a grinding wheel relative to the roll, said system comprising:

means for generating a set of infeed positioning signals which respectively define inward and outward motions of the grinding wheel;

means for generating a first additional infeed positioning signal which is to be combined with the infeed positioning signal defining inward motion of the grinding wheel;

means for generating a second additional infeed positioning

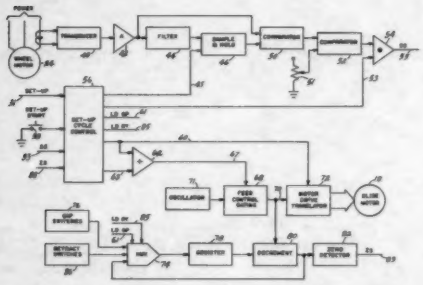
signal which is to be combined with the infeed positioning signal defining outward motion of the grinding wheel; and means, responsive to said first set of infeed positioning signals and said first and second additional infeed positioning signals, for moving the grinding wheel.

4,371,942

METHOD AND APPARATUS FOR CONTROLLING AN AUTOMATIC SET-UP CYCLE OF OPERATION

Gerasimos Damikolas, West Chester, Ohio, assignor to Cincinnati, Milacron Inc., Cincinnati, Ohio

Filed Mar. 18, 1981, Ser. No. 245,045
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—475 **11 Claims**



1. A control apparatus connected to a machine having a base supporting a workpiece, a cutting tool, a machine slide and a slide drive connected to the control apparatus for producing relative motion between the cutting tool and the workpiece, said control apparatus executing a set-up cycle of operation to establish a predetermined positional relationship between the cutting tool and the workpiece prior to executing a machining cycle of operation, the control apparatus comprising:

(a) means for selectively storing a final position signal representing a final position of the cutting tool relative to the workpiece;

(b) means for initiating a set-up cycle of operation;

(c) means responsive to the initiating means for producing a forward signal to cause the cutting tool and the workpiece to move into superficial contact;

(d) means for generating a sense signal in response to the superficial contact between the cutting tool and the workpiece;

(e) means responsive to the generating means for producing a reverse signal to cause the cutting tool and the workpiece to move apart in response to the sense signal; and

(f) means responsive to the storing means for stopping motion of the cutting tool at the final position in response to the final position signal thereby establishing the predetermined positional relationship between the cutting tool and the workpiece.

4,371,943

EXTERNAL MEANS FOR DETECTING NORMAL ZONES IN SUPERCONDUCTING MAGNETS OR COILS

Eugene L. Woods, and Gustav D. Magnuson, both of San Diego, Calif., assignors to General Dynamics Corporation/Convair Div., San Diego, Calif.

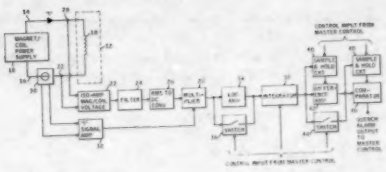
Filed Oct. 6, 1980, Ser. No. 194,566
Int. Cl.³ G06F *15/20;* G01N *27/02;* G01R *27/08*
U.S. Cl. 364—481 **10 Claims**

7. In a circuit including a cryostat in which a magnet/coil is made superconducting and further including a power supply, means for detecting normal zones in said superconducting coil comprising;

means outside said cryostat for deriving a signal representative of the voltage applied to said magnet/coil,

means outside said cryostat for deriving a signal representative of the current applied to said magnet/coil,

means for combining said voltage and current representative signals into a signal representative of the energy consumed by the coil,



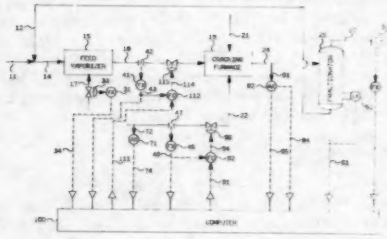
means for sampling said energy consumed representative signals as a value of energy consumed in one time period and comparing this value with the value of an energy consumed signal in a prior equal time period to determine any change in energy as a means for detecting normal zones forming in said coil.

4,371,944

ETHYLENE PROCESS CONTROL

William S. Stewart; Gary L. Funk, and Dexter E. Smith, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 16, 1981, Ser. No. 225,508
Int. Cl.³ G06F *15/46;* C10G *9/36*
U.S. Cl. 364—502 **14 Claims**



1. Apparatus comprising:

a cracking furnace means;

means for supplying a feed stream to said cracking furnace means;

means for supplying a diluent fluid to said cracking furnace means, said diluent fluid being combined with said feed stream;

means for supplying a fuel to said cracking furnace means, the combustion of said fuel supplying heat to said cracking furnace means;

a fractional distillation column means;

means for removing a gaseous mixture, containing the cracked components of said feed stream and containing said diluent fluid, from said cracking furnace means and for providing desired components of said gaseous mixture as a feed to said fractional distillation column means;

means for removing an overhead stream containing ethylene from said fractional distillation column means;

means for establishing a first signal representative of the actual flow rate of said overhead stream;

means for establishing a second signal representative of the desired flow rate of said overhead stream;

means for comparing said first signal and said second signal

and for establishing a third signal responsive to the difference between said first signal and said second signal;

means for establishing a fourth signal representative of the actual heat being supplied to said cracking furnace means;

means for comparing said third signal and said fourth signal and for establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal;

means for manipulating the heat input to said cracking furnace means in response to said fifth signal;

means for establishing a sixth signal representative of the ratio of the concentration of an undesired component in said gaseous mixture to the concentration of ethylene in said gaseous mixture (severity equivalent);

means for establishing a seventh signal representative of the desired severity equivalent;

means for comparing said sixth signal and said seventh signal and for establishing an eighth signal responsive to the difference between said sixth signal and said seventh signal; and

means for manipulating the flow rate of said feed stream to said cracking furnace means in response to said eighth signal.

4,371,945

ELECTRONIC PEDOMETER

Lawrence J. Karr, 220 Horizon St., Venice, Calif. 90291; Gary L. Wasserman, 2669 Rambla Pacifico, Malibu, Calif. 90265, and George R. Boehme, Venice, Calif., assignors to Lawrence Joseph Karr and Gary Lee Wasserman, both of Marine del Rey, Calif.

Filed Dec. 1, 1980, Ser. No. 211,684
Int. Cl.³ G01C *22/00*
U.S. Cl. 364—561 **15 Claims**

2. A pedometer comprising measurement means for measuring the maximum distance between the user's legs for each step taken by the user, means responsive to the measurement means for determining the stride length for each step taken by the user, means for adding together the stride lengths over a plurality of steps, and means for displaying a sum of the stride lengths over the plurality of steps, and in which the measurement means for measuring the maximum distance between the user's legs includes:

means positioned on one leg of the user for emitting ultrasonic energy;

means positioned on the other leg of the user for detecting the emitted ultrasonic energy; and

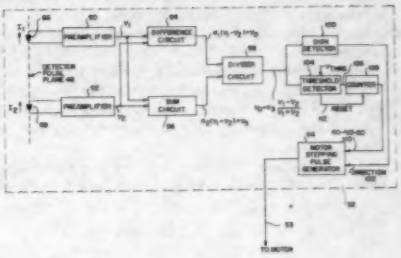
means responsive to the means for detecting the emitted ultrasonic energy for determining the maximum distance between the user's legs.

4,371,946

SERVOMECHANISM FOR DOPPLER SHIFT COMPENSATION IN OPTICAL CORRELATOR FOR SYNTHETIC APERTURE RADAR

Nicholas J. Constantinides, and Thomas J. Bicknell, both of Pasadena, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 9, 1980, Ser. No. 195,547
Int. Cl.³ G01S *13/90;* **G06G** *7/66*
U.S. Cl. 364—822 **16 Claims**



8. A synthetic aperture radar data optical correlator having means for detecting and tracking doppler shifts in said radar data comprising:

a reflective surface for directing a laser beam at a signal film containing said radar data;

a range telescope positioned to receive said laser beam after being modulated by said radar data;

a Fourier transform filter for removing a DC component and a virtual image component from said modulated laser beam;

an azimuth telescope for focusing said modulated laser beam, after having passed through said Fourier transform filter, on an image film;

first means for determining first and second light level intensities at two cross-sectional portions of said modulated laser beam after having passed through said Fourier transform filter; and

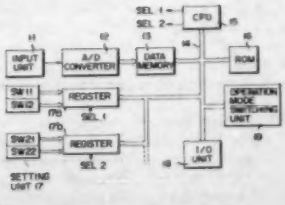
second means responsive to said first means for altering the angle of said reflective surface with respect to said laser beam reflected therefrom until the light level intensities at said two cross-sectional portions have a predetermined relationship with respect to each other.

4,371,947

ROM CONTROLLED PROTECTIVE RELAY SYSTEM FOR POWER TRANSMISSION NETWORK

Norio Fujisawa, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 26, 1980, Ser. No. 134,074
Claims priority, application Japan, Mar. 27, 1979, 54-36129
Int. Cl.³ G06F *3/05, 9/06, 15/06;* **G05B** *15/02*
U.S. Cl. 364—900 **7 Claims**



1. A digital protective relay system comprising:

an input unit for obtaining analog electric quantities representing physical quantities such as voltage on and current in a power transmission system;

an analog-to-digital converter for converting the output of said input unit into corresponding digital data;

a data memory for memorizing said digital data from said analog-to-digital converter;

a read only memory in which a program for executing calculations on the basis of a judgement formula for a plurality of protective relay functions is stored, said judgement formula including a constant whose magnitude is settable, a further constant whose sign can be selected and which can be set at zero or at a predetermined value, and an inequality, the kind of inequality being selectable;

a setting unit for setting the magnitude of the first-mentioned constant;

an operation mode switching unit for selecting the sign of the further constant and for setting the further constant to zero or to the predetermined value and for selecting the kind of the inequality to select a particular protective relay function; and

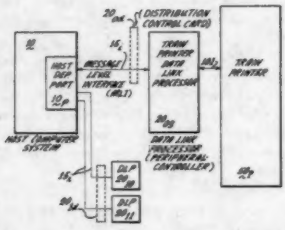
a central processing unit for executing digital calculations based upon the selected relay function utilizing the memory content in said data memory and the judgement formula.

4,371,948

TRAIN PRINTER-DATA LINK PROCESSOR

David P. Chadra, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 7, 1980, Ser. No. 148,160
Int. Cl.³ G06F *3/12*
U.S. Cl. 364—900 **10 Claims**



1. In a peripheral-controller for controlling a peripheral train-printer mechanism having "n" print hammers for printing an "n" column line with any of a series of "m" characters transmitted from main memory of a main host computer, said train-printer mechanism including a rotating train-block carrying at least "m" character slugs, and said host computer providing command words, delimiter characters and data-link task identifier words to communicate to said peripheral-controller, and said peripheral-controller returns result descriptor words to inform said main host computer of the completion/incompletion of each task initiated, a train-printer peripheral-controller comprising:

(a) a common front end circuit unit for storing, sequencing and executing instruction micro-codes for controlling operation of said peripheral-controller and including:

(a1) RAM buffer memory storage means, controlled by a peripheral dependent circuit unit, for temporary storage of data, said storage means including:

(a1-1) a first dedicated memory area, designated print image buffer, for storing codes of data characters representing one full line of print to be reproduced by said train printer mechanism in its printout;

(a1-2) a second dedicated memory area designated train image buffer, for storing codes of characters located on rotating train blocks in said train printer mechanism;

(a1-3) a third dedicated area for storing control data for said said peripheral-controller and information data for said host computer;

(a1-4) and wherein each of said first, second and third dedicated memory areas includes:

(i) addressable memory locations where each memory location can store two 8-bit character codes which are symbolized as a top character code, AB, and a bottom character code, CD, and each set of 4-bits is represented by A or B or C or D;

(b) a peripheral dependent circuit unit for providing address signals to said RAM buffer memory storage means and control signals to said peripheral train printer mechanism for operation of print hammers and paper motion, said peripheral dependent circuit unit including:

(b1) means to generate address signals for alternately accessing character codes in said first and said second dedicated memory areas for each of "n" columns to be scanned for printing;

(b2) means to convey accessed character codes from said first and second dedicated memory areas to a comparison means;

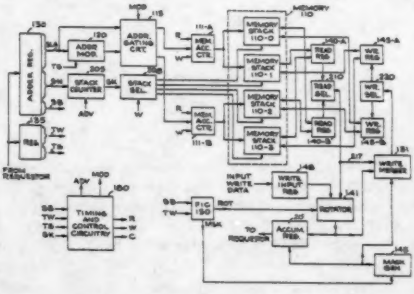
(b3) comparison means for sensing a match or non-match in said accessed character codes from said first and second memory areas for each print column involved and for causing the activity of a columnar print hammer in said train printer mechanism when a match is sensed, and wherein said comparison means includes: logic means for comparing said top-character and said bottom-character from said first memory area with said top-character and said bottom-character from said second memory area.

4,371,949

TIME-SHARED, MULTI-PHASE MEMORY ACCESSING SYSTEM HAVING AUTOMATICALLY UPDATABLE ERROR LOGGING MEANS

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 929,048, Jul. 28, 1978, abandoned, which is a division of Ser. No. 801,868, May 31, 1977, Pat. No. 4,174,537. This application Jun. 23, 1980, Ser. No. 162,218
Int. Cl.³ G06F *11/08;* G11C *29/00;* H03K *13/32*
U.S. Cl. 364—900 **10 Claims**



1. In combination:

means providing items of digital data, each having an associated check code chosen to permit the indication of a plurality of different types of data error conditions which may be present with respect to said items of data;

signal pattern generation means to which said items of data and their associated error check codes are sequentially applied, said signal pattern generating means being re-

sponsive to said data items and associated check codes to generate one of a plurality of different data error signal patterns indicating which if any of said plurality of different types of data error conditions is present with respect to each item of data; and

error log circuitry to which the data error signal patterns generated by said signal pattern generation means are applied;

said error log circuitry including first means for decoding said signal patterns and in response to said decoding providing indications of the occurrence of at least two of said different types of error conditions which may be present with respect to a plurality of data items applied to said signal pattern generation means over a predetermined time period;

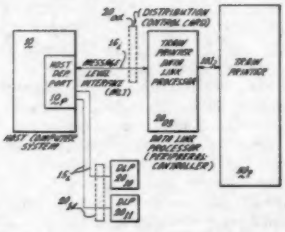
said error log circuitry also including second means responsive to said signal patterns and to said indications of different types of data error conditions provided by said first means for establishing priorities between particular applied data error signal patterns and for indicating the highest priority data error signal pattern obtained for a plurality of data error signal patterns applied to said error log circuitry over said predetermined time period.

4,371,950

PERIPHERAL CONTROL INTERFACE CIRCUIT FOR TRAIN PRINTER-DATA LINK PROCESSOR

David P. Chadra, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 26, 1980, Ser. No. 163,271
Int. Cl.³ G06F 3/00
U.S. Cl. 364—900 **10 Claims**



1. In a peripheral-controller which includes a peripheral interface control circuit and which regulates transfer of data to be printed from a main host system to a train printer mechanism having a motor-driven print train module having notched gear teeth and carrying graphic symbols which rotate across a paper train juxtaposed to a series of print hammers, wherein one print hammer is situated opposite each column to be printed, and wherein said train printer mechanism includes printer-logic means for selecting what column will be printed and which character will be printed in response to data and control signals from said peripheral-controller, a peripheral control interface circuit comprising:

(a) pulse generation means, synchronized with each rotation of said print train module, for generating a signal pulse for each print column of a line to be printed on said paper train during each revolution of said print train module across a line of said paper train, said pulse generation means providing a signal to said printer-logic means to cause a scan of information relates to the next print-column for printout of any character-match between a train character located at that particular column and a data character transmitted from said peripheral-controller;

(b) data line control and connection means for conveying coded data to said train printer mechanism;

(c) means for receipt and sensing of control information signals from said train printer mechanism;

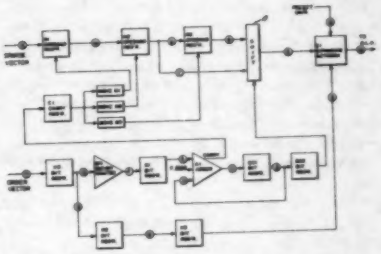
(d) signal generation means to signal said train printer mechanism to select whether said coded data conveyed is for paper print-format control or graphic character printout.

4,371,951

APPARATUS FOR CONVERTING SERIAL INPUT SPARSE VECTOR FORMAT TO PARALLEL UNPACKED FORMAT FOR INPUT TO TANDEM ARITHMETIC LOGIC UNITS

Raymond C. Kort, New Brighton, and James W. Kelley, Stacy, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 29, 1980, Ser. No. 191,808
Int. Cl.³ G06F 5/04
U.S. Cl. 364—900 **4 Claims**



1. In a computer having an arithmetic logic unit capable of processing at least one predetermined number of operands in tandem, said computer further adapted to process sparse vectors, said sparse vectors having corresponding order vectors having bits of two types, a first type indicative of the location of sparse vector operands in an expanded vector, a second type indicative of the location of operands of a preselected value; for each sparse vector to be coprocessed by said arithmetic logic unit, the improvement comprising:

means for fetching said order vector bits group by group until all order vector bits have been fetched; the numbers of bits in each group being equal to said predetermined number of operands said arithmetic logic unit is capable of processing in tandem;

means responsive to said means for fetching order vector bits for developing a population count of the number of bits of said first type in a group of order vector bits;

means responsive to said means for developing a population count for forwarding a first plurality of operands from said sparse vector equal in number to said population count;

means for aligning and ordering said first plurality of operands into an expanded group according to the alignment and order of said first type bits in said group of order vector bits;

means for generating operands of a preselected value;

means for inserting said operands of a preselected value into said expanded group according to the alignment and order of said second type bits in said group of order vector bits; and

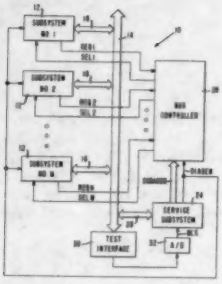
means for forwarding said expanded group of aligned and ordered operands in tandem to said arithmetic logic unit.

4,371,952

DIAGNOSTIC CIRCUITRY FOR ISOLATING A FAULTY SUBSYSTEM IN A DATA PROCESSING SYSTEM

David B. Schuck, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed May 6, 1981, Ser. No. 261,316
Int. Cl.[3] G06F *11/00*
U.S. Cl. 364—900 10 Claims



1. In a data processing system having a plurality of subsystems connected to a system bus, wherein a fault at one of said subsystems will cause a signal of a predetermined level to be continuously provided to said bus, the improvement wherein said data processing system further comprises diagnostic circuitry for locating the one of said subsystems having the fault, said diagnostic circuitry comprising:

means associated with each of said subsystems for selectively providing a signal of said predetermined level to said bus; and

means connected to said bus for detecting a change in the condition of said bus after each of said subsystems selectively provides said predetermined level signal to said bus.

4,371,953

ANALOG READ ONLY MEMORY

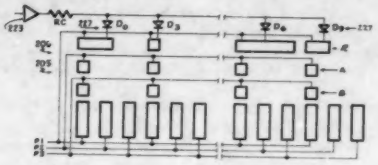
Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation-in-part of Ser. No. 101,881, Dec. 28, 1970, abandoned, Ser. No. 134,958, Apr. 19, 1971, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 230,872, Mar. 1, 1972, Ser. No. 232,459, Mar. 7, 1972, Ser. No. 246,867, Apr. 24, 1972, Pat. No. 4,310,878, Ser. No. 288,247, Sep. 11, 1972, Pat. No. 4,121,284, Ser. No. 291,394, Sep. 22, 1972, Ser. No. 302,771, Nov. 1, 1972, Ser. No. 325,933, Jan. 22, 1973, Pat. No. 4,016,540, Ser. No. 325,941, Jan. 22, 1973, Pat. No. 4,060,848, Ser. No. 366,714, Jun. 4, 1973, Pat. No. 3,986,022, Ser. No. 490,816, Jul. 22, 1974, Pat. No. 4,209,853, Ser. No. 476,743, Jun. 5, 1974, Ser. No. 522,559, Nov. 11, 1974, Pat. No. 4,209,852, Ser. No. 550,231, Feb. 14, 1975, Pat. No. 4,209,843, Ser. No. 727,330, Sep. 27, 1976, abandoned, Ser. No. 730,756, Oct. 7, 1976, Ser. No. 754,660, Dec. 27, 1976, Ser. No. 752,240, Dec. 20, 1976, and Ser. No. 801,879, May 31, 1977, Pat. No. 4,144,582. This application Jul. 1, 1977, Ser. No. 812,285
Int. Cl.[3] G11C *17/00, 27/00*
U.S. Cl. 365—103 27 Claims

1. A non-volatile memory system comprising:

means for storing analog information in non-volatile form; wherein said storing means includes a plurality of electrodes and wherein each electrode of said plurality of electrodes includes electrode area means for storing the analog information in a dimensional characteristic of an electrode related to the analog information stored therein;

means for generating an analog charge signal for each of said plurality of electrodes proportional to the area of the respective electrode; and



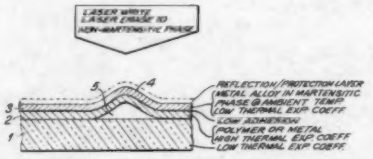
charge transfer means for generating an analog output signal in response to the analog charge signal.

4,371,954

REVERSIBLE MEMORY STRUCTURE WITH THERMO-OPTICAL WRITING AND OPTICAL READING AND PROCESS FOR WRITING AND ERASING SAID STRUCTURE

Jean Cornet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 27, 1981, Ser. No. 228,990
Claims priority, application France, Feb. 1, 1980, 80 02245
Int. Cl.[3] G11C *13/04;* G11B *7/24*
U.S. Cl. 365—126 7 Claims



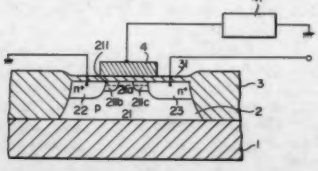
1. A reversible memory structure with thermo-optical writing or inscription and optical reading, supported by a substrate performing a forward movement, wherein the substrate is a material having a low expansion coefficient and the inscribable layer deposited on the substrate is formed by at least two individual layers, constituted by a first layer made from a material which, under the action of heat, deforms a second superimposed layer of a relatively inexpansible alloy which is at ambient temperature in a martensitic phase and has a transformation to another crystallographic phase at a temperature below the melting temperature of the first layer.

4,371,955

CHARGE-PUMPING MOS FET MEMORY DEVICE

Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 15, 1980, Ser. No. 122,059
Claims priority, application Japan, Feb. 22, 1979, 54-20094
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—185 12 Claims



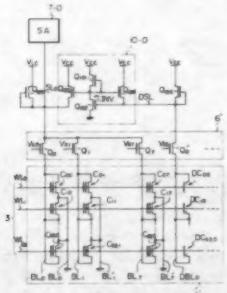
1. A semiconductor memory device comprising:

an electrically floating semiconductor layer;
a source and a drain region formed in said semiconductor layer;
a gate insulating layer formed on said semiconductor layer and a gate electrode formed on said insulating layer;
said memory device having a threshold voltage for conduction of a first value and normally storing one of "0" and "1" information values;
means for selectively applying a gate voltage to said gate electrode exceeding said first threshold voltage value of said device to produce a bias voltage in said semiconductor layer, said semiconductor layer storing said bias voltage produced by said gate voltage and establishing thereby a threshold voltage of a second value different from said first value, thereby to store the other of said "0" and "1" information values;
said memory device selectively storing "0" and "1" information values in accordance with a desired, predetermined relationship of said "0" and "1" information values and said different bias and corresponding threshold voltage values;
said semiconductor layer further comprising a central region having a low threshold voltage and side regions having a high threshold voltage, formed in said semiconductor layer between said source region and said drain region;
said first voltage threshold value being determined by said high threshold voltage of said side regions, and said side regions undergoing pinch-off prior to pinch-off occurring in said central region upon removal of said selectively applied gate voltage and
means for producing a read-out current from said memory device, the level of the read-out current differing in accordance with the different bias and corresponding threshold voltage values and thereby affording read-out of the information value stored in said memory device.

4,371,956
SEMICONDUCTOR DEVICE

Kohichi Maeda, Yokohama, and Masanobu Yoshida, Kawaguchi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,664
Claims priority, application Japan, Dec. 4, 1979, 54-157054
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—185 **6 Claims**

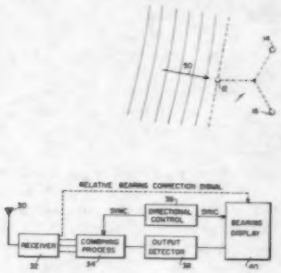


1. A semiconductor memory device comprising:
a substrate of a first conductivity type;
a plurality of arrays of MIS main memory cells of a charge-storage type disposed on said substrate;
a plurality of bit lines, each connected to a respective one of said arrays of MIS main memory cells;
at least one array of dummy memory cells of the same type as said MIS main memory cells arranged along one of said bit lines;
at least one dummy bit line, connected to said at least one array of dummy memory cells, said at least one dummy bit line being of the same type as said bit lines; and
at least one compensating circuit means, connected to said at least one dummy bit line and to at least one of said bit lines, for detecting the potential of said at least one dummy bit line and supplying compensating currents to said at least one of said bit lines and said at least one dummy bit line responsive to the potential of said at least one dummy line.

4,371,957
ANTISUBMARINE WARFARE SYSTEM

Oscar A. Sandoz, and John Mar, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Dec. 12, 1969, Ser. No. 889,852
Int. Cl.³ G01S *3/82*
U.S. Cl. 367—3 **15 Claims**



1. A system for determining the direction of an underwater discrete source of acoustic vibrations by sensing acoustic wavefronts produced thereby, comprising a semirigid generally neutrally buoyant underwater platform made of a water inflated soft walled element, an acoustic wavefront sensing array of at least three omnidirectional hydrophones mounted on said platform in a preselected geometric arrangement, and a telemetry link including transmitting means and receiving means, said transmitting means being connected to said hydrophones, and array steering means connected with said receiving means to allow determination of the time relationship of the signals obtained from said hydrophones.

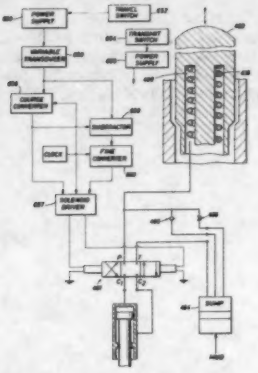
4,371,958
DRILLING ORIENTATION TOOL

Jack R. Claycomb, 8226 Waynemer, Houston, Tex. 77040

Continuation-in-part of Ser. No. 890,368, Mar. 27, 1978, Pat. No. 4,184,545, and a continuation-in-part of Ser. No. 887,725, Mar. 16, 1978, Pat. No. 4,235,021. This application Jan. 21, 1980, Ser. No. 113,560
Int. Cl.³ E21B *47/12*
U.S. Cl. 367—85 **6 Claims**

1. A device for forming a mud flow modulated signal installable in a drill string, the device comprising:
(a) an elongate, hollow outer body adapted to be connected in a drill string;
(b) an elongate, tubular inner body received within said outer body;
(c) means positioning said inner body in said outer body to form an annular space between said inner body and outer body directing mud flow through said annular space;

(d) a closed hydraulic reservoir in said inner body and exposed to pressure of the mud flow through said annular space;
(e) hydraulic fluid line means extending from said reservoir for delivering hydraulic fluid under pressure;
(f) a piston in a cylinder;
(g) constriction means in said annular space which directs the mud flow therethrough which constriction means is located in said outer body and which further directs the mud flow downwardly through said outer body;



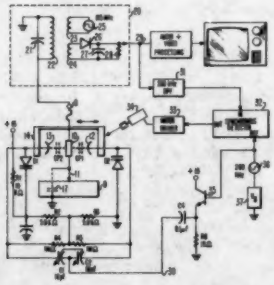
(h) plug means extending into said constriction means for varying the mud flow permitted through said constriction means, said plug means being movable by said piston relative to said constriction means;
(i) electrically operated control valve means connected to said piston and cylinder for controllably delivering hydraulic fluid thereto from said hydraulic line means for controllably moving said piston in said cylinder; and
(j) transducer means having an electrical output and adapted to respond to a variable of interest and which transducer means encodes the variable to form an electrical output to operate said control valve means.

4,371,959

POSITION SENSOR FOR VIDEO DISC

William G. McGuffin, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,025
Int. Cl.³ G11B *9/06*
U.S. Cl. 369—43 **8 Claims**



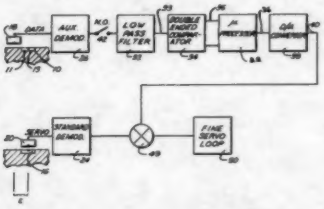
1. An improved video disc stylus position sensor system of the type having a signal pickup stylus secured to a stylus arm, said stylus arm being compliantly mounted in a carriage assembly for translating the pickup stylus radially across a record disc and permitting relative movement between the pickup stylus and the carriage assembly, said pickup stylus connected to pickup circuitry for sensing capacitance between said stylus and the disc record, said sensor system having first and second variable capacitors formed by first and second electrodes secured to the carriage and a third electrode disposed therebetween, said third electrode forming one plate of both said first and said second variable capacitors, said third electrode secured in fixed relation to said pickup stylus, and having first and second voltage variable capacitances connected respectively between said first electrode and AC ground potential and said second electrode and AC ground potential, and wherein the stylus position signal is extracted from an output signal from said pickup circuitry by a frequency selective circuit, wherein the improved stylus position sensor comprises:
means for applying a pilot signal;
first and second capacitors each having a first terminal connected to a first node and having respective second terminals connected respectively to said first and second electrodes;
a buffer amplifier having an output terminal connected to said first node and an input terminal connected for receiving said pilot signal, the output impedance of the amplifier being sufficiently small that parametric changes in said impedance do not effect significant phase changes between the pilot signal applied to the amplifier signal input terminal and the pilot signal coupled through said amplifier to the first and second electrodes via said first and second capacitors.

4,371,960

MEASUREMENT OF DISC SERVO HEAD/DATA HEAD MISALIGNMENT

Gerald C. Kroiss, Minneapolis, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 24, 1980, Ser. No. 219,709
Int. Cl.³ G11B *21/10*
U.S. Cl. 369—43 **4 Claims**



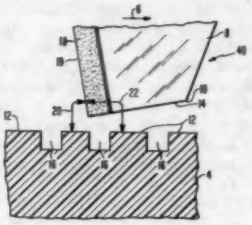
1. In a method of compensating for radial offset between a disk drive's servo head and a data head wherein at least one track of data surface servo data is written on a data surface and at least one track of servo surface servo data is written on a servo surface in vertical alignment with said data surface servo data, an auxiliary demodulator is connected with the data head to develop a position error signal from said data surface servo data and a standard demodulator is connected with the servo head in a servo loop for developing a position error signal from said at least one track of servo surface servo data, the improvement comprising:
A. measuring the position error signal due to the radial offset between the servo head and the data head as developed by the standard demodulator connected to the servo head;
B. converting this signal into a digital value; and
C. storing it in a digital memory for later compensating for said radial offset in fine positioning of a data head over a data track center by retrieving said digital value from

memory, converting it to a voltage via a digital-to-analog converter and injecting said voltage into the servo loop.

4,371,961
CAPACITIVE INFORMATION SYSTEM

Gerald D. Rose, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 21, 1980, Ser. No. 208,983
Int. Cl.³ G11B *11/06*
U.S. Cl. 369—126 **7 Claims**



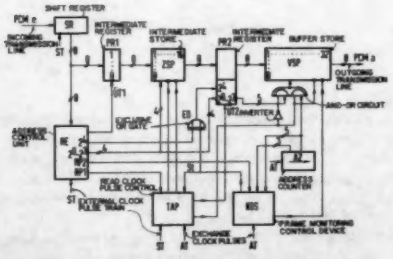
1. In an information storage and recovery system which comprises a playback stylus, having a dielectric support element and a conductive electrode, and a grooved conductive record disc, in which information is recorded, wherein the information is recovered on playback while there is relative motion between the record surface and the stylus by sensing capacitive variations between the stylus conductive electrode and the record surface;

wherein the improvement comprises employing that angle between the electrode face and the record surface such that the respective paths of dielectric effects between the electrode face and the record surface in the direction of relative motion and in the direction opposite the direction of relative motion are balanced.

4,371,962
CIRCUIT ARRANGEMENT FOR COMPENSATING PHASE DIFFERENCES OF NON-SYNCHRONOUS CLOCK PULSE RATES OF A TELECOMMUNICATION SYSTEM

Rolf Zeitraeg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,770
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936938
Int. Cl.³ H04J *3/06*; H04L *7/04*
U.S. Cl. 370—100 **4 Claims**



1. Circuit arrangement for a pulse coded time division multiplex (PCM) telecommunication system for compensating phase differences resulting from deviations between rates of an external clock pulse train controlling transmission of information across an incoming transmission line and of a non-synchronous internal clock pulse train controlling switching operations of an exchange, said circuit arrangement being arranged between said incoming transmission line for serial transmission of PCM information and an outgoing transmission line connected to the exchange for parallel transmission of PCM words which correspond to PCM information sampled from one speech channel and being transferred in one channel time slot, comprising:

(a) first storage means for consecutively storing PCM words for half of a pulse frame and having parallel data inputs and respective data outputs for one PCM word, said first storage means being designed for two modes of operation, wherein during one channel time slot defined by said external clock pulse train in an active mode of operation at first a stored PCM word is read out from a selected storage location and then a new PCM word separated from the previously stored PCM word by a half of a pulse frame is written in, and in a non-active mode the same PCM word first is temporarily buffered and read out thereafter;

(b) an intermediate register having a capacity for one PCM word and for a binary coded channel address, and having corresponding parallel data inputs and outputs, and parallel address inputs and outputs, said data inputs being connected in parallel with respective ones of said data outputs of said first storage means;

(c) second storage means for consecutively storing PCM words of a full pulse frame under control of said internal clock pulse train and having parallel data inputs connected to said data outputs of said intermediate register, having data outputs connected to said outgoing transmission line and having address inputs;

(d) means for generating consecutive binary coded channel addresses of an entire pulse frame under control of said external clock pulse train and having parallel address outputs for channel address bits and connected in parallel with both respective address inputs of said first storage means and address inputs of said intermediate register; and

(e) control means for determining the mode of operation of said first storage means dependent upon a minimum off-set of read addresses and write addresses for the second storage means, wherein the mode of operation of the first storage means is changed and the most significant bit of a full channel address is inverted whenever the current offset is lower than said minimum.

4,371,963
METHOD AND APPARATUS FOR DETECTING AND CORRECTING ERRORS IN A MEMORY

Gordon L. Edwards, Jr., Easley, S.C., and Walter A. Smith, Kettering, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1980, Ser. No. 220,221
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—50 **8 Claims**

1. An error detection and correction system comprising:

means for storing data including a first section, said data being stored in said first section in rows and columns, with a predetermined number of said rows of data forming a block in said first section;

first means for generating and storing first check bits for said rows of data; and

error correcting means, including:

second means for generating check bits for said columns of data so as to produce a check word for each said block;

a second section for storing said check words;

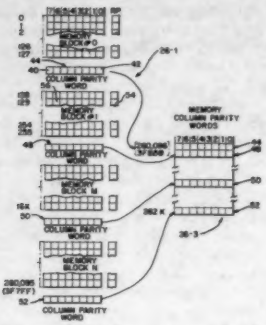
and

processor means operatively coupling said first and second means with said first and second sections;

said processor means including:

means for detecting an error in one of said rows as indicated by the associated said first check bit with the row containing an error being referred to as an error row;

third means for generating a new check word for all said rows of data except said error row in the associated said block when an error row is found by said detecting means; and



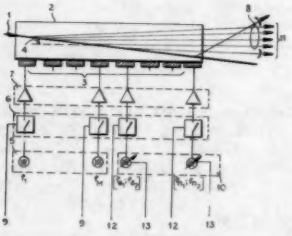
means for Exclusive ORing said new check word with the said check word for said block to thereby obtain corrected data for said error row.

4,371,964

CIRCUIT ARRANGEMENT FOR CONTROLLING A MULTI-BEAM ACOUSTO-OPTICAL CELL IN WHICH BRAGG DIFFRACTION IS USED FOR THE GENERATION OF A PLURALITY OF OUTGOING LASER BEAMS

Andras Podmaniczky; Szabolcs Tokes, and Attila M. Lenk, all of Budapest, Hungary, assignors to Magyar Tudomanyos Akademia Szamitastechnikai es Automatizalasi Kutato Intezete, Budapest, Hungary

Filed Apr. 8, 1980, Ser. No. 138,420
Claims priority, application Hungary, Apr. 18, 1979, MA 3134
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—38 **7 Claims**



1. An apparatus for generating a variety of laser-beam patterns which comprises:

a Bragg diffraction acousto-optical cell having an input end and an output end;

means for directing a laser beam into said cell at said input end of said acousto-optical cell whereby said laser beam traverses said cell and can be diffracted therein to produce a plurality of output laser beams emerging from said output end of said acousto-optical cell;

a plurality of ultrasonic transducers integral with said cell and spaced apart between said input end of said cell and said output end of said cell, the number of said transducers being equal at most to the number of said output beams, said ultrasonic transducers being electrically activatable to generate respective ultrasonic waves in said cell to cause Bragg diffraction of the laser beam traversing said cell and produce said output beams;

a group of constant-frequency oscillators equal in number at most to the number of said output beams and of differing frequencies, said oscillators being connected to respective ones of said transducers for applying electrical signals thereto to enable said transducers to diffract the laser beam traversing said cell within a respective diffraction-angle range and produce a respective one of said output laser beams;

at least one variable-frequency oscillator having a frequency-determining control input and connected to one of said transducers assigned to one of said output laser beams, said variable-frequency oscillator having a variable-frequency range nonoverlapping with those of said constant-frequency oscillators producing said output beams for producing at least one further output laser beam;

means for applying an alternating signal to said control input of said variable-frequency oscillator to continuously deflect said further output beam in response to said alternating signal; and

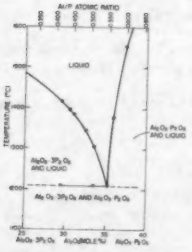
a respective control state between each oscillator and the respective transducer for modulating the signal transmitted between the respective oscillator and transducer, each control state having a respective control input for receiving modulating signals.

4,371,965

HIGH NEODYMIUM CONTENT ALUMINOPHOSPHATE GLASS AND LASER

Alexander Lempicki, Wayland, and Richard M. Klein, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 7, 1978, Ser. No. 931,703
Int. Cl.³ H01S *3/17*
U.S. Cl. 372—40 **5 Claims**



1. A laser comprising

an optical resonance cavity defined by a first totally reflective mirror and a second partially transmissive mirror,

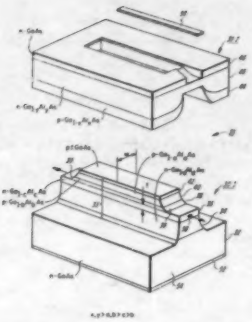
a glass laser medium disposed within said optical resonance cavity, said glass laser medium consisting of from about 0.01 mole percent to about 13 mole percent neodymium oxide, from about 25 mole percent to about 35 mole percent aluminum oxide, and from about 60 mole percent to about 70 mole percent phosphorus pentoxide, and

an optical pumping means disposed adjacent to said optical resonance cavity for exciting said glass laser medium to emit stimulated radiation.

4,371,966
HETEROSTRUCTURE LASERS WITH COMBINATION ACTIVE STRIP AND PASSIVE WAVEGUIDE STRIP

Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1980, Ser. No. 204,430
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 **8 Claims**

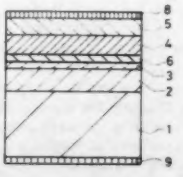


1. In a heterostructure laser comprising a plurality of contiguous semiconductor layers epitaxially deposited on a substrate, one of said layers being an active region and having a lower bandgap and higher index of refraction than at least cladding layers immediately adjacent to the active region to permit carrier recombination and support radiation propagation between transverse end facets of the laser under lasing conditions, means incorporated on and/or in said laser to confine current to a portion of said active region, means in said active region to optically confine radiation propagating therein in both dimensions transverse to the direction of propagation, the extremities of said active region means falling short of said end facets, passive waveguide means extending from said end facets and optically coupled to said active region means to receive at least a portion of said propagating radiation, said passive waveguide means optically confining radiation propagating therein in both dimensions transverse to the direction of propagation, said passive waveguide means is an elongated strip contiguous to a surface of said active region means, said passive waveguide strip being of full extent between said end facets with the ends of said active region means being taper coupled to said passive waveguide strip.

4,371,967
SEMICONDUCTOR LASER

Masaru Wada, Takatsuki; Hirokazu Shimizu, Toyonaka; Takashi Sugino, Takatsuki, and Kunio Itoh, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 12, 1980, Ser. No. 215,665
Claims priority, application Japan, Dec. 19, 1979, 54-165878
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 **6 Claims**



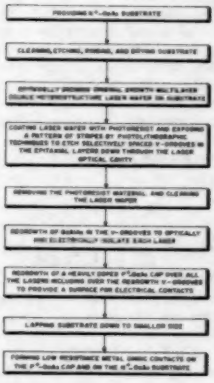
1. In a semiconductor laser comprising a semiconductor substrate and epitaxial layers formed thereon including an active layer,

at least one semiconductor layer neighboring said active layer being a composite layer comprising two component layers of a same conductivity type and doped with, for one layer in direct contact with said active layer, a dopant of a diffusion coefficient smaller than that of another dopant doped in the other layer of said two component layers, both of said two component layers having energy gaps wider than that of said active layer, and said one layer in direct contact with said active layer having an energy gap narrower than that of said the other layer of said two component layers.

4,371,968
MONOLITHIC INJECTION LASER ARRAYS FORMED BY CRYSTAL REGROWTH TECHNIQUES

C. Ward Trussell, Jr., Woodbridge, and James E. Miller, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1981, Ser. No. 279,394
Int. Cl.³ H01S 3/19; H01L 21/208
U.S. Cl. 372—50 **11 Claims**



1. A process for forming a monolithic injection laser array, the steps comprising:

cleaning, etching, rinsing, and drying an N+-GaAs substrate;

epitaxially growing an orginal growth multilayer double heterostructure GaAlAs laser wafer on said substrate;

selectively etching V-grooves in the epitaxial layers down through the optical cavity of the laser;

preparing said laser wafer for crystal regrowth;

regrowing by crystal regrowth GaAlAs in said V-grooves to optically and electrically isolate each adjacent laser;

regrowing by crystal regrowth a heavily doped $P^{\pm}$GaAs cap over all the lasers in the laser array including over said crystal regrowth GaAlAs in said V-grooves;

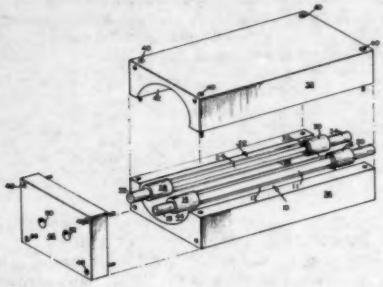
thinning said substrate by lapping; and

depositing metal ohmic contacts on said $P^{\pm}$GaAs cap and on the lapped N+-GaAs substrate to provide electrical connections to an external power source.

4,371,969
LOW COST LASER

Evan P. Chicklis, Nashua, and James R. Mosto, North Conway, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 5, 1978, Ser. No. 912,826
Int. Cl.³ H01S 3/00
U.S. Cl. 372—77 **11 Claims**

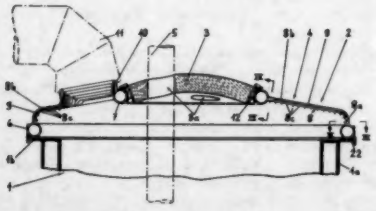


1. A laser comprising:
a reasonant cavity including a solid state laser rod;
means for abstracting energy from said cavity; and
pumping means for pumping said laser rod, said pumping means including:
a solid metal whose combustion in oxygen occurs at sufficiently high temperatures so that the ensuing optical radiation will maintain oscillations in said laser rod;
a source of oxygen which will maintain combustion of said metal;
means for providing a sustaining flow of said oxygen past said metal; and
means for igniting said metal.

4,371,970
DOME FOR ELECTRIC ARC FURNACE

Bernard Guilpain, Saint Etienne, and Xavier Tinchant, Villars, both of France, assignors to Clesid S.A., Saint-Chamond, France

Filed Jul. 10, 1980, Ser. No. 168,468
Claims priority, application France, Feb. 22, 1980, 80 03924
Int. Cl.³ F27D 1/12
U.S. Cl. 373—74 **7 Claims**

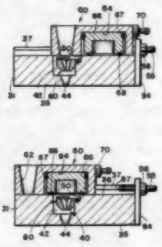


1. A dome for an electric arc furnace of the type comprising a central portion (3) of refractory material and a cooled metallic crown (4) comprising two concentric toroidal pipes (6, 7) connected by radial tubes (8) to form an internal conduit for assuring the circulation of a cooling fluid in said crown, said dome comprising means for collecting gases originating from the production of steel and having a generally curved shape concave toward the base of said furnace, and said crown having a monolithic structure.

4,371,971
SAMPLE LOADING MECHANISM

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed May 15, 1980, Ser. No. 149,916
Int. Cl.³ F27D 3/00, 11/04
U.S. Cl. 373—115 **8 Claims**

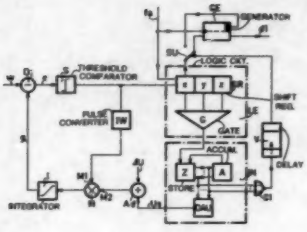


1. An apparatus for dropping a relatively small sample into a crucible of a combustion furnace comprising:
hopper means having a floor for releasably holding a relatively small sample, said hopper means including an element movable between a first position closing said floor for holding a sample in said hopper and a second position opening said floor for releasing a sample;
actuating means coupled to said movable element for moving said element between said first and second positions;
a base adapted to be mounted to a combustion furnace and including a generally vertically extending aperture means for receiving said hopper means, and means for coupling said hopper means to said base such that samples can be placed in said hopper means, and further including means coupled to said base for selectively sealing an upper end of said aperture means, wherein said movable element of said hopper comprises a jaw pivotally movable from a closed to an open position, wherein said jaw is pivotally coupled to said base and wherein said actuating means comprises a control rod movably coupled to said base and coupled to said jaw for moving said jaw to at least said open position, said hopper further including a stationary jaw and wherein said stationary jaw and said first named jaw include downwardly and inwardly converging sidewalls to position a sample placed in said hopper on the floor of said hopper; and
wherein said sealing means comprises a plate slideably positioned on an upper surface of said base and including an aperture extending vertically therethrough to align with said hopper when said plate is in a first position, said plate further including a seal which is aligned over and sealably engages a top surface of said base around said aperture when said plate is in a second position.

4,371,972
ADAPTIVE DELTA MODULATOR

Dieter Schwarz; Ralf Misner, both of Nuremberg, Fed. Rep. of Germany, and Johannes W. Glasbergen, Bussum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1981, Ser. No. 227,833
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002960
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—30 3 Claims

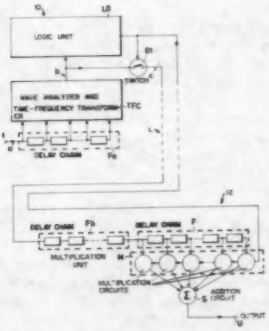


1. An adaptive delta modulator for producing a delta coded output signal in response to an input signal, said delta modulator including a filter whose input signal is a pulse sequence derived from said delta coded output signal by a logic processing circuit and whose output voltage determines the instantaneous quantizing unit of said delta modulator, characterized in that said delta modulator further comprises a generator for producing a periodic 0–1 sequence, means coupled to the output of said filter for detecting when the output voltage therefrom has zero value, and means coupled to said detecting means for alternatively coupling the output of said generator to the output of said adaptive delta modulator instead of said delta coded output signal in response to said detecting means.

4,371,973
APPARATUS FOR TRANSFORMING, TRANSFERRING AND RE-TRANSFORMING OF A SAMPLED SIGNAL

Tore Fjällbrant, Hökasvägen, pl. 67, 430 80 Hovas, Sweden

Filed Jun. 10, 1980, Ser. No. 158,241
Claims priority, application Sweden, Jun. 19, 1979, 7905408
Int. Cl.³ H03K *3/013, 5/156*
U.S. Cl. 375—58 2 Claims



1. An apparatus for transforming a uniformly sampled signal to a non-uniformly sampled signal in a transmitter, transferring the signal thus non-uniformly sampled to a receiver, and re-transforming the transferred non-uniformly sampled signal to a uniformly sampled signal in the receiver, comprising:

a transmitter including:

a delay chain receiving the uniformly sampled signal and providing a plurality of outputs,

a wave analyzer for emitting signals divided into frequency sectors, the analyzer including inputs connected to the outputs of the delay chain, and further including outputs,

a logic unit connected to the outputs of the wave analyzer for analyzing the signals from the wave analyzer and generating a control signal dependant upon the result of said analysis, said control signal containing information on frequency sectors comprising samples with signal amplitudes which are low relative to the samples in other sectors,

a time-frequency transformer for transforming signal blocks of samples in the time domain to corresponding signal blocks of samples in the frequency domain, the time-frequency transformer being connected to the outputs of the delay chain and to the logic unit;

a first switch for excluding certain samples in blocks of samples in the frequency domain in response to said control signal and outputting the same; and

a receiver including:

a frequency-time transformer receving said frequency domain signals output from said switch and retransforming said signal blocks of samples in the frequency domain to corresponding signal blocks of samples in the time domain, said frequency-time transformer for reconstructing previously excluded samples and comprising:

a first delay chain having delay elements, for receiving said frequency domain signals and providing a plurality of outputs,

a second delay chain with at least as many delay elements as said first delay chain, said second delay chain receiving said frequency domain signals and providing at least one output to the input of said first delay chain,

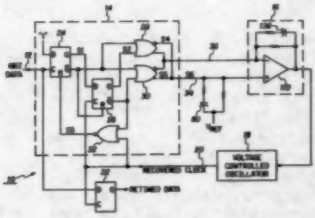
a multiplication unit having a plurality of inputs connected to said outputs of said first delay chain and receiving said control signal from said transmitter, said multiplication unit being for weighted multiplication of samples with coefficients stored in a memory under control of the control signal, and

an an addition unit having inputs connected to the outputs of the multiplication unit and adding together the samples therefrom to form the output of the apparatus.

4,371,974
NRZ DATA PHASE DETECTOR

John M. Dugan, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1981, Ser. No. 238,179
Int. Cl.³ H03L *7/06*
U.S. Cl. 375—82 1 Claim



1. An NRZ data phase detector comprising:

first and second flip-flops, each having a data input, a clock input, a reset input, a first output and a second output providing a logic value which is the complement of said first output,

said first flip-flop having a fixed logical value at its data

input and receiving NRZ data at its clock input, so as to set the first flip-flop at a first data transition,

said second flip-flop receiving at its data input one of the outputs of the first flip-flop and receiving at its clock input a recovered clock signal, so that said second flip-flop becomes set on a first transition of said recovered clock signal while said first flip-flop is set,

reset gate means having the output thereof connected to the reset input of said first flip-flop and responsive to one of the outputs of said second flip-flop and to said recovered clock for resetting said first flip-flop upon the occurrence of a second transition of said recovered clock while said second flip-flop is set, thereby generating from said first flip-flop a variable duration pulse initiated by said data transition and terminated by said second clock transition,

said second flip-flop receiving at the reset input thereof one of the outputs of the first flip-flop, so as to reset the second flip-flop upon reset of the first flip-flop, thereby generating a fixed duration pulse determined by said first and second clock transitions,

output gate means responsive to outputs of said first and second flip-flops for deriving phase information from said variable and fixed duration pulses.

4,371,975

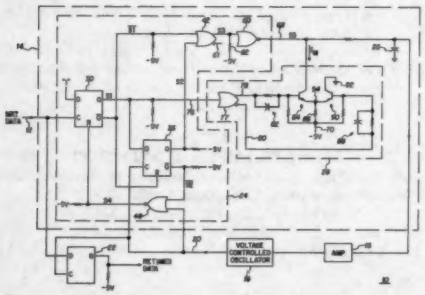
SAMPLING NRZ DATA PHASE DETECTOR

John M. Dugan, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1981, Ser. No. 238,181

Int. Cl.³ H03L *7/06*

U.S. Cl. 375—120 **17 Claims**



1. A sampling NRZ data phase detector suitable for applications with long sequences of no data activity, comprising:

phase error means for detecting the phase difference between data transitions and clock transitions, and outputting phase signals;

energy storage means for accumulating and holding said phase signals; and

sampling switching means between said phase error means and said energy storage means and controlled by said phase error means so as to (i) be responsive to a data transition to switch to a first state enabling said energy storage means to sample the output of said phase error means, and (ii) be responsive to a designated clock transition following said data transition to switch to a second state isolating the signal level in said energy storage means from erroneous phase information from said phase error means.

4,371,976

X-RAY APPARATUS FOR DETERMINING THE ABSORPTION DISTRIBUTION IN A FLAT EXAMINATION ZONE

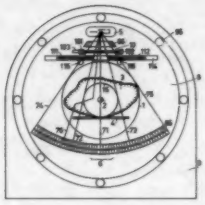
Wolfgang Wagner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1980, Ser. No. 149,782

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920051

Int. Cl.³ G21K *1/04*; G01N *23/08*

U.S. Cl. 378—16 **4 Claims**



1. In apparatus for determining an X-ray absorption distribution in a planar examination zone which is situated in a body, the body being disposed within a positioning zone which encloses the examination zone, of the type comprising:

X-ray source means which function to produce X-rays, diaphragm means which function to form X-rays produced by the source means into a flat fan-shaped beam which passes through the positioning zone in the plane of the examination zone, detector means situated adjacent the positioning zone which function to receive and measure X-rays in the beam which have passed through the positioning zone, positioning means which function to cause the source means to irradiate the positioning zone from a plurality of successive positions around an axis which extends through the examination zone transverse to the plane thereof, and means which function to attenuate X-rays in the beam so that the average flux of the X-rays which pass through the examination zone is greater than the average flux of the X-rays which pass through the positioning zone but which do not pass through the examination zone; the improvement wherein

the means which function to attenuate comprise:

one or more absorber pieces which intercept X-rays and which define edges which are oriented transverse to the axis and

means which function to move the absorber pieces in synchronism with the operation of the positioning means so that at certain of the positions around the axis the absorber pieces completely shield X-rays which pass through the positioning zone but do not pass through the examination zone from reaching the detector means and the absorber pieces only partially shield said portion of the x-ray beam at others of said positions.

4,371,977

METHOD FOR DETECTING SOLIDIFICATION IN A MIXED PHASE CONTAINER

John M. Jenkins, III, South Charleston, W. Va.; Max E. Carter, Sr., Victoria, Tex.; Michael L. Green, Scott Depot, W. Va., and Marvin E. Cavender, Victoria, Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 17, 1980, Ser. No. 160,288

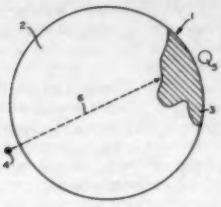
Int. Cl.³ G01N *23/00*

U.S. Cl. 378—51 **4 Claims**

1. A method for detecting solidification in a mixed phase low pressure fluidized bed olefin polymerization reactor having volume comprising:

A. disposing a radiation source and a radiation detector such

that radiation from said radiation source will pass through a radiation path through at least a portion of the volume of said reactor to reach said radiation detector,



B. detecting solidification in said radiation path by noting a decrease in the amount of radiation reaching said radiation detector.

4,371,978

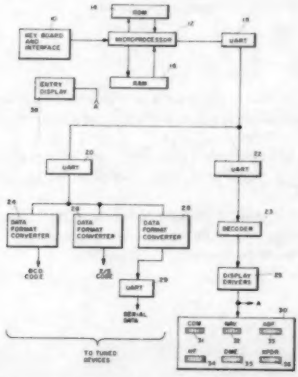
AUTOMATIC TUNING SYSTEM

Richard J. Lukso, Tucson, Ariz., assignor to Jet Electronics and Technology Incorporated, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 103,430, Dec. 14, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,170

Int. Cl.³ H04B *1/38*

U.S. Cl. 455—77 **27 Claims**



1. A system for providing tuning control signals for automatically controlling the tuning of a plurality of independent simultaneously operable avionic transceivers each of which is assigned a predetermined frequency spectrum mutually exclusive of the frequency spectra of the other transceivers comprising:

data entry means permitting an operator to enter a desired frequency and responsive to such entry for providing signals identifying the desired frequency; and

circuit means coupled to said data entry means for comparing the signals therefrom with stored data defining the frequency spectra associated with the plurality of avionic transceivers and for providing control output signals for tuning the one of said avionic transceivers assigned the frequency spectrum within which the desired frequency lies to the entered frequency without changing the tuning of the avionic transceivers having frequency spectra within which the desired frequency does not lie.

4,371,979

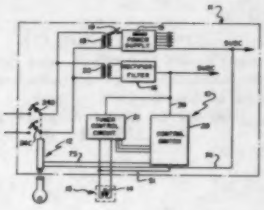
METHOD AND APPARATUS FOR AFFORDING SELECTIVE ACCESS TO ADDITIONAL TELEVISION CHANNELS

Friedrich Vesterling, Blasdell, N.Y., assignor to WNY Hospital Television, Inc., Buffalo, N.Y.

Filed Jun. 3, 1981, Ser. No. 270,147

Int. Cl.³ H04N *7/16*; H04B *1/16*; H04N *5/44*

U.S. Cl. 455—180 **25 Claims**



21. The method of affording selective access to a second group of available channels of a television in addition to a first group of available channels of said television, comprising the steps of:

providing immediate access to said first channel group when the viewer turns on said television;

continuously holding closed a manually-operable selector switch for a predetermined time interval in order to select access to the second channel group; and

controlling the operation of a control switch circuit to afford access to said second channel group after passage of said predetermined time interval.

4,371,980

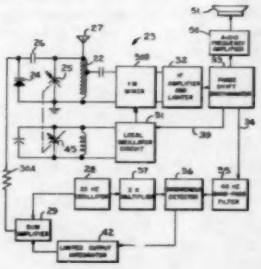
SELF ALIGNING BAND-PASS FILTERING SYSTEM

Bert K. Erickson, Fayetteville, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,879

Int. Cl.³ H04B *1/18*

U.S. Cl. 455—208 **14 Claims**



1. A tunable band-pass filtering system responsive to the carrier frequency of a frequency modulated signal in the band-pass for substantial alignment therewith comprising:

a. a tunable band-pass filter having a phase characteristic which is substantially linear to signal frequencies in the mid-band range of the filter and non-linear to signal frequencies at either edge band range of the filter;

b. means for periodically varying the midfrequency of the band-pass filter at a predetermined frequency rate whereby, said filter, in response to an applied frequency modulated signal, provides a similar frequency modulated

signal including phase modulation at said predetermined frequency rate; and

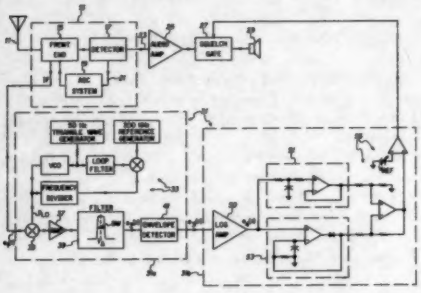
c. means including an amplitude limiter responsive to the magnitude of phase modulation applied at the predetermined frequency rate, to said similar frequency modulated signal for automatically tuning the midfrequency of the filter to reduce the frequency difference between the carrier frequency of the frequency modulated signal and the midfrequency of the filter.

4,371,981

SPECTRAL SQUELCH

Dennis D. King; Ronald L. Breitwisch, and James D. Nickum, all of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 14, 1980, Ser. No. 140,397
Int. Cl.³ H04B 1/16
U.S. Cl. 455—219 **2 Claims**



1. A receiver comprising:

demodulator means including at least one of an RF stage or an IF stage,

demodulator intelligence processing means connected to said demodulator means, and including gating means, and

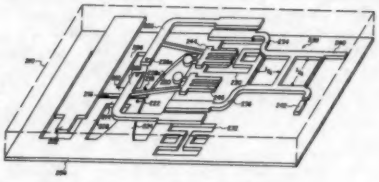
squelch circuit means connected to said demodulator means and to said gating means for controlling said gating means, said squelch circuit means comprising (i) a swept band spectrum analyzer first means connected to said demodulator means for receiving as input a predetermined one of demodulator RF or IF, the received input containing noise and possibly one or more RF or IF carriers, said first means for providing, in response to its received input, a single output whose amplitude varies with time and which is representative of the frequency spectrum of the received input, (ii) second means connected to the single output of said first means, and having a predetermined output amplitude versus input amplitude transfer function, said transfer function being non-linear and for effecting compression, and (iii) third means, connected for receiving an output of said second means, for commanding said gating means to a disable condition whenever a predetermined ratio of (A) strongest carrier in the first means input, to (B) noise in the first means input, is incurred, said commanding occurring at said ratio even if from one instance of commanding to another there is a change in the magnitude of difference between (A) and (B).

4,371,982

MICROWAVE FREQUENCY CONVERTER WITH ECONOMICAL COUPLING

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 13, 1981, Ser. No. 243,231
Int. Cl.³ H04B 1/26
U.S. Cl. 455—327 **14 Claims**



1. A frequency converter comprising in combination:

a mixer bridge for heterodyne modulation product signal generation,

a pair of unbalanced microstrip conductors leading from said bridge respectively to a pair of balun IF rejection filters; and

a second pair of unbalanced microstrip conductors leading respectively from said pair of balun IF rejection filters to a microstrip branch line coupler.

DESIGN PATENTS

GRANTED FEB. 1, 1983

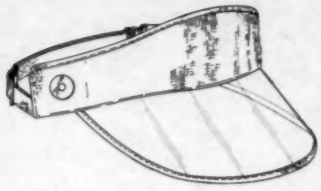
ERRATA

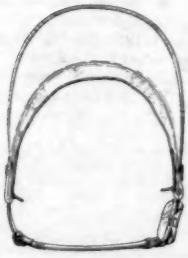
For CLASS	See PATENT NO.
D14–114	267,787
D92–032	267,828

DESIGNS

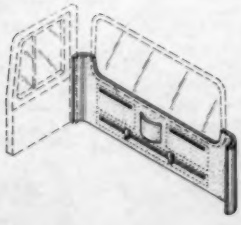
FEBRUARY 1, 1983

267,752
COMBINED SUN VISOR AND RADIO RECEIVER
Peter G. Fairbrother, Carrumbin, Australia, assignor to Glenwood Limited, Hong Kong
Filed May 19, 1980, Ser. No. 150,871
Claims priority, application United Kingdom, Mar. 3, 1980, 80993881
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—241

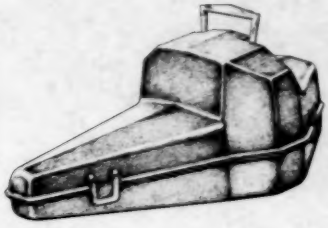




267,753
VEHICLE ARTICLE CARRIER
Bruno Urban, 520 S. Courtland, Park Ridge, Ill. 60068
Filed Jun. 13, 1980, Ser. No. 159,233
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D3—40

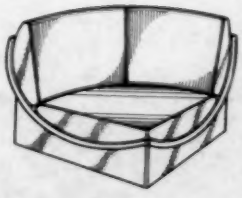


267,754
CHAIN SAW CASE
James C. Carroll, Bartlesville, Okla., and Lewis T. Johnson, Carrollton, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 21, 1981, Ser. No. 226,590
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—72



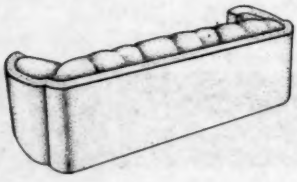
267,755
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,007
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1

267,756
CUSHIONED CHAIR
Pramuan Krabeepetcharat, Mission Viejo, Calif., assignor to dellaRobbia Incorporated, Irvine, Calif.
Filed Jan. 14, 1981, Ser. No. 224,974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

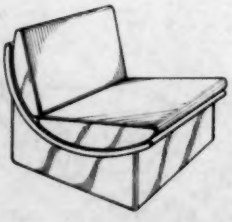


267,757
CHAIR
Roger K. Leib, 1064 S. Crescent Heights Blvd., Los Angeles, Calif. 90035
Filed Jan. 26, 1981, Ser. No. 228,094
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

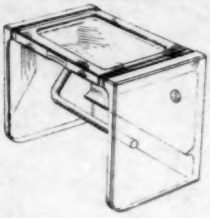
267,758
SOFA
Walter F. Dybal, Westminster, Calif., assignor to Shelly & Anderson Furniture Mfg. Co., Inc., Compton, Calif.
Filed Jan. 26, 1981, Ser. No. 228,666
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



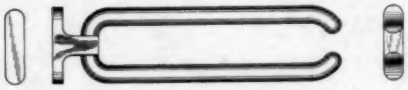
267,759
CUSHIONED SEAT
Pramuan Krabeepetcharat, Mission Viejo, Calif., assignor to dellaRobbia Incorporated, Irvine, Calif.
Filed Jan. 14, 1981, Ser. No. 224,975
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



267,760
TOILET PAPER HOLDER
Guy Vrignaud, Grenoble, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 4, 1981, Ser. No. 231,345
Claims priority, application Hague, Aug. 18, 1980, DM/000 313
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

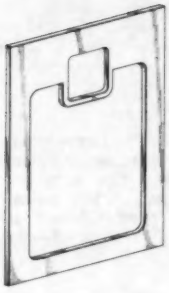


267,761
TOWEL RAIL
Piet Cohen, Amsterdam, Netherlands, assignor to Materias Plasticas, Limitada, Leiria, Portugal
Filed Nov. 4, 1980, Ser. No. 204,061
Claims priority, application Portugal, May 9, 1980, 15.089
Term of patent 14 years
Int. Cl. C23—*02*
U.S. Cl. D6—99



267,762
SPICE RACK
Herbert S. Chase, 1 Lincoln Plz., New York, N.Y. 10023
Filed Oct. 17, 1980, Ser. No. 197,924
Term of patent 14 years
Int. Cl. D6—*04*; D7—*02*
U.S. Cl. D6—113

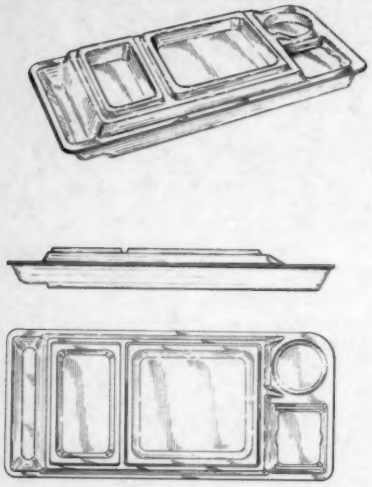
267,763
IMAGE FRAME
Joel C. Huck, P.O. Box 42230, Houston, Tex. 77042
Division of Ser. No. 954,910, Oct. 26, 1978, Pat. No. Des. 260,718. This application Apr. 24, 1981, Ser. No. 256,995
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



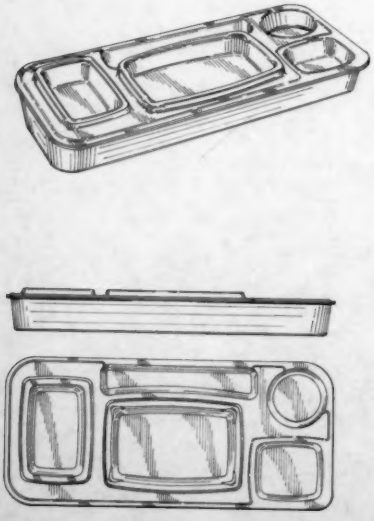
267,765
DRIP PROOF CUP
Myron I. Hankin, 125 South St., Philadelphia, Pa. 19147
Filed Jun. 17, 1980, Ser. No. 160,343
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

267,764
CORNER LOCK FOR FRAMES
Alf H. Sundberg, Sollentuna, Sweden, assignor to A-Teknik Alf Sundberg Aktiebolag, Sollentuna, Sweden
Filed Dec. 10, 1980, Ser. No. 216,509
Claims priority, application Sweden, Jun. 10, 1980, 80 1171
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246

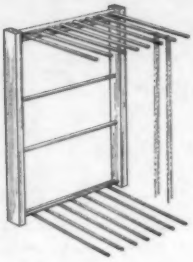
267,766
TRAY
Harold W. Storrs, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Nov. 28, 1980, Ser. No. 211,363
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



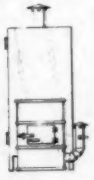
267,767
TRAY
Harold W. Storrs, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Nov. 28, 1980, Ser. No. 211,364
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



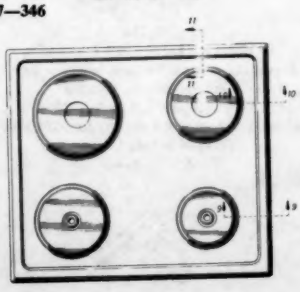
267,768
COMBINED PASTA DRYING RACK AND TRIVET
James E. Duggan, 1991 Dellwood Dr. NW., Atlanta, Ga. 30309
Filed Aug. 14, 1980, Ser. No. 178,378
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—76



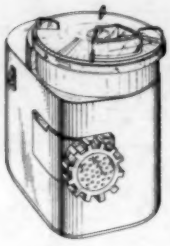
267,769
BARBEQUE SMOKER
Ozell J. Pope, 1820 W. Lindsey, Norman, Okla. 73070
Filed Aug. 25, 1980, Ser. No. 180,632
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—332

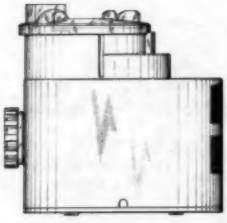


267,770
COOKING APPLIANCE
Karl Fischer, Am Gaensberg 8, 7519 Oberderdingen, Fed. Rep. of Germany
Filed Jun. 9, 1978, Ser. No. 913,992
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, MRII/85 Br
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—346



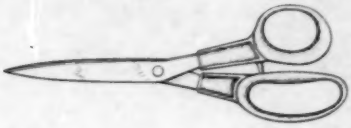
267,771
DOUGH MACHINE
Alfredo Cavalli, Via Monza 97, 20060 Gessate, Milano, Italy
Filed Nov. 19, 1980, Ser. No. 208,429
Term of patent 14 years
Int. Cl. D07—*04;* D15—*08*
U.S. Cl. D7—376



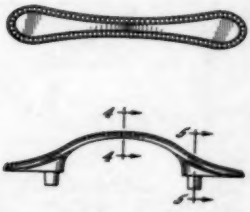


267,772
SHOVEL
Lowell D. Heimdal, Joice, Iowa, assignor to North Iowa Tool and Die, Lake Mills, Iowa
Filed Oct. 6, 1980, Ser. No. 194,665
Term of patent 14 years
Int. Cl. D8—*1*
U.S. Cl. D8—9

267,773
SCISSORS
Erkki O. Linden, Billnäs, Finland, assignor to Oy. Fiskars AB, Helsinki, Finland
Filed Feb. 29, 1980, Ser. No. 126,151
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

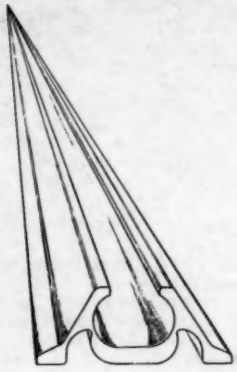


267,774
PULL
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 24, 1980, Ser. No. 219,967
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—317



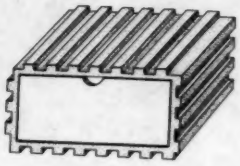
267,775
INSULATION SUPPORT
J. L. Holcombe, Dallas, Tex., assignor to Emerson H. Mizell, Atlanta, Ga.
Filed May 5, 1980, Ser. No. 146,288
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380

267,776
MOUNTING STRIP FOR ELECTRIC CABLES OR SIMILAR ARTICLES
Lennart Holgersson, Bredaryd, and Berne Mahl, Smalandsstenar, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Oct. 23, 1980, Ser. No. 200,086
Claims priority, application Sweden, Apr. 24, 1980, 80-0845
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396



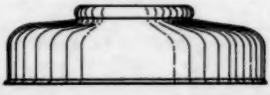
267,777
COMBINED PACKAGING AND DISPLAY CONTAINER
Kenneth Niimi, Highland Park, and Richard J. Simmons, Carol Stream, both of Ill., assignors to Reed-Union Corporation, Chicago, Ill.
Filed Jan. 16, 1981, Ser. No. 225,708
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—347

267,778
BOX
Toyohiro Nagata, 2-7, Higashi Kozucho, Ten'nojiku, Osaka, Japan
Filed Oct. 9, 1979, Ser. No. 82,959
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



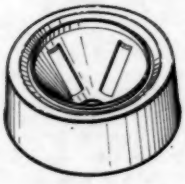
267,779
CONTAINER TOP
Donald J. Roth, Westport, Conn., assignor to The Continental Group, Inc., New York, N.Y.
Filed Sep. 26, 1980, Ser. No. 191,234
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434

267,780
CONTAINER TOP
John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Sep. 26, 1980, Ser. No. 191,238
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434



267,781
DISPENSING CAP FOR A CONTAINER
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed Jul. 14, 1980, Ser. No. 168,141
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—447

267,782
DISPENSING CAP FOR A CONTAINER
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed Jul. 14, 1980, Ser. No. 168,142
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—447

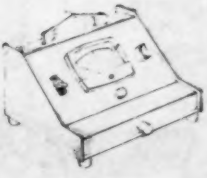


267,783
CLEANER CAN
William J. Lang, P.O. Box 1731, Central Valley, Calif. 96019
Filed Jan. 17, 1980, Ser. No. 113,032
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—499

267,784
STOP WATCH
Jack W. Heuer, Bern, Switzerland, assignor to Heuer-Leonidas S.A., Biel, Switzerland
Filed Jan. 12, 1981, Ser. No. 224,301
Claims priority, application Hague, Jul. 18, 1980, DM/000273
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

267,785
STOP WATCH
Jack W. Heuer, Bern, Switzerland, assignor to Heuer-Leonidas S.A., Biel, Switzerland
Filed Jan. 12, 1981, Ser. No. 224,302
Claims priority, application Hague, Jul. 18, 1980, DM/000273
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

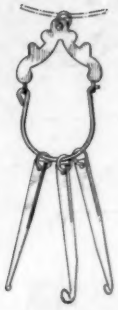
267,786
SALT METER
Charles S. Wolf, Studio City, Calif., assignor to Life Power Products, Inc.
Filed Dec. 12, 1980, Ser. No. 215,673
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81



267,787
WARNING LAMP
Eugen Braun, Hasseler Str. 50-54, 4020 Mettmann, Fed. Rep. of Germany
Filed Jul. 25, 1980, Ser. No. 172,465
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, MR959
Term of patent 14 years
Int. Cl. D10—*06;* D26—*02*
U.S. Cl. D14—114

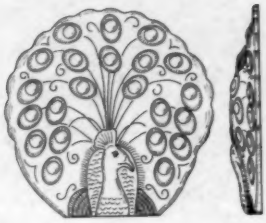
267,788
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Nov. 18, 1980, Ser. No. 207,987
Claims priority, application Italy, May 27, 1980, 35779/80[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5

267,789
NECKLACE PENDANT
Carol M. Winandy, 1295 Des Plaines Ave., Des Plaines, Ill. 60018
Filed Jan. 2, 1981, Ser. No. 222,026
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

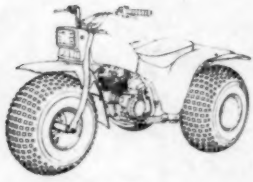


267,790
PENDANT
Charles Eddinger, P.O. Box 487, Geyserville, Calif. 95441
Filed Dec. 11, 1980, Ser. No. 215,504
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

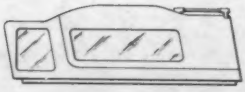
267,791
PLAQUE
Karen G. Clark, 650 Cherry St., Hammond, Ind. 46324
Filed Feb. 5, 1981, Ser. No. 233,072
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137



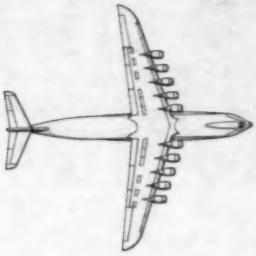
267,792
MOTOR TRICYCLE
Yasuhiro Ohba, Fukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1981, Ser. No. 277,502
Claims priority, application Japan, Dec. 26, 1980, 55-54959
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



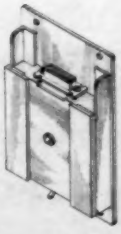
267,793
DESIGN FOR A PICK-UP TRUCK BED ENCLOSURE
Wilbert L. Skidmore, Benzonia, Mich., assignor to Glas-Tek, Inc., Benzonia, Mich.
Filed Apr. 12, 1979, Ser. No. 29,399
Term of patent 14 years
Int. Cl.[3] D12—*16*
U.S. Cl. D12—156



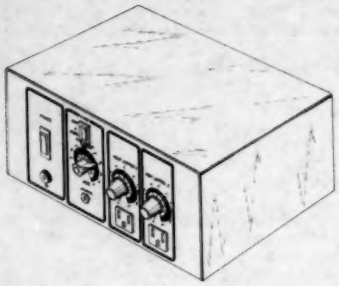
267,794
AIRCRAFT DESIGN
Hubert Krojer, Bermatingen, Fed. Rep. of Germany, assignor to Dornier GmbH, Fed. Rep. of Germany
Filed Dec. 17, 1979, Ser. No. 104,708
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—337



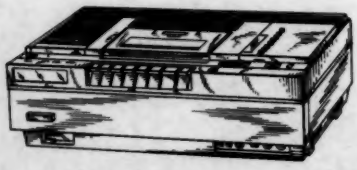
267,795
BATTERY HOLDER
William D. Mallon, Centerville, Va., assignor to Perrott Engineering Labs, Inc., Arlington, Va.
Filed May 27, 1980, Ser. No. 153,544
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10



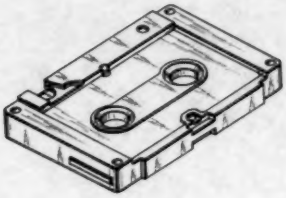
267,796
ORNAMENTAL DESIGN FOR A POWER SUPPLY UNIT
Kenneth C. Litt, and Jean C. Fielder, both of Silver Spring, Md., assignors to Pace Incorporated, Laurel, Md.
Filed Mar. 27, 1980, Ser. No. 134,480
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11



267,797
VIDEO TAPE RECORDER
Masaharu Kobayashi, Ohmiya, and Mitsuru Inaba, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sep. 12, 1980, Ser. No. 186,692
Claims priority, application Japan, Mar. 12, 1980, 55-9668
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—2

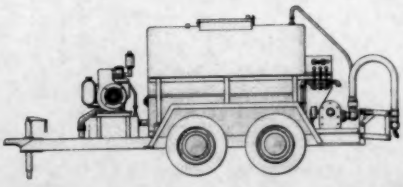


267,798
TAPE CARTRIDGE
Frank Dekker, Santa Ana, and Isaac R. Cherry, Mission Viejo, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.
Filed Oct. 17, 1980, Ser. No. 197,927
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



267,799
FACSIMILE TRANSCEIVER
Akira Esaki; Tsutomu Yamasaki, and Keiji Sakata, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1980, Ser. No. 188,382
Claims priority, application Japan, Mar. 22, 1980, 55/11429
Term of patent 14 years
Int. Cl. D14—*01, 02, 03*
U.S. Cl. D14—94

267,800
MOBILE ASPHALT PAVEMENT SEALING MACHINE
Jimmy W. Tate, 22 W. Watson St., Anniston, Ala. 36201
Filed Jun. 23, 1980, Ser. No. 162,178
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—13

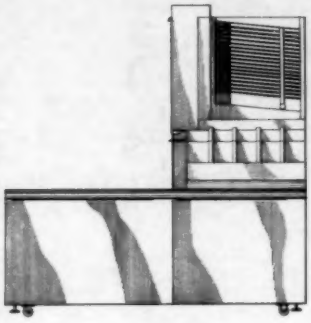


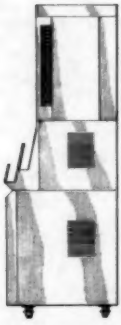
267,801

SORTER WITH DOCUMENT HOLDING SHELVES

William L. Plumb, New York, and Andrew T. Serbinski, Brooklyn, both of N.Y., assignors to Nashua Corporation, Nashua, N.H.

Filed Apr. 12, 1979, Ser. No. 29,333
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



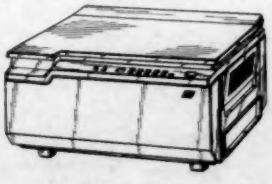


267,802

ELECTRONIC COPYING MACHINE

Shigeki Yasutani, Kashiwa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 4, 1981, Ser. No. 231,503
Claims priority, application Japan, Aug. 5, 1980, 55-31738
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

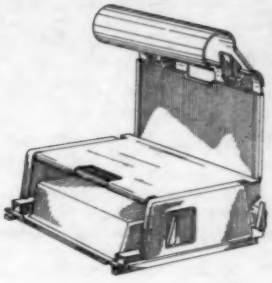


267,803

CONTINUOUS PAPER INPUT MODULE

Robert E. Kalvitis, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 811,018, Jun. 29, 1977. This application Apr. 9, 1979, Ser. No. 28,407
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

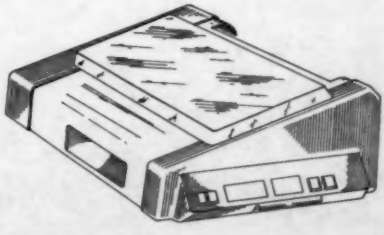


267,804

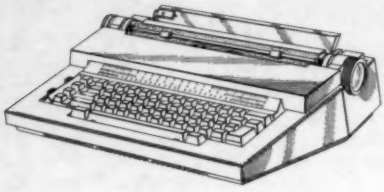
TRACTOR FEED MODULE FOR CONTINUOUS PAPER

Robert E. Kalvitis, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

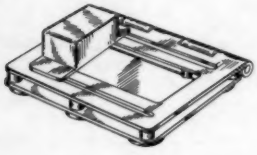
Continuation-in-part of Ser. No. 811,020, Jun. 29, 1977. This application Apr. 9, 1979, Ser. No. 28,408
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



267,805
PORTABLE ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Mar. 17, 1981, Ser. No. 244,737
Claims priority, application Italy, Sep. 17, 1980, 53514-B/80
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



267,806
PORTABLE CARD IMPRINTER
Charles W. Panter, 841 N. York Rd., Apt. 232, Elmhurst, Ill. 60126
Filed Oct. 27, 1980, Ser. No. 200,761
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—14

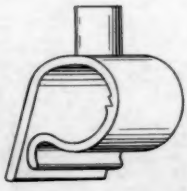


267,807
CALENDAR
Robert C. Burroughs, 408 W. Deer Park Rd., Gaithersburg, Md. 20760
Filed Apr. 8, 1980, Ser. No. 138,459
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—24

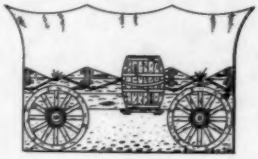
267,808
COMBINED PERIODICAL AND WRITING INSTRUMENT HOLDER
Thomas J. Russo, 2228 Bergen Ave., Brooklyn, N.Y. 11234
Filed Jul. 18, 1979, Ser. No. 58,601
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—78

267,809
CLIPBOARD
Vernon L. Lowery, Anaheim, and Richard Vega, Westminster, both of Calif., assignors to Pfeiler & Associates, Engineers, Inc., Fullerton, Calif.
Filed Feb. 12, 1981, Ser. No. 234,098
Term of patent 7 years
Int. Cl. D19—*99*
U.S. Cl. D19—88

267,810
COMBINED SIGN SUPPORT AND CLIP THEREFOR
Nicholas M. Orsos, 3 Kurrawa Ave., Coogee Beach, N.S.W., Australia
Filed May 8, 1980, Ser. No. 147,791
Term of patent 14 years
Int. Cl. D20—*03*; D8—*08*
U.S. Cl. D20—43

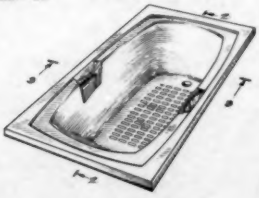


267,811
SIMULATIVE TENT
ilip M. Grebe, 4050 S. Asbury, Indianapolis, Ind. 46227
Filed Sep. 15, 1980, Ser. No. 187,190
Term of patent 14 years
Int. Cl. D21—*04*
S. Cl. D21—253

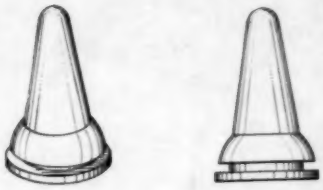


267,812
DUAL SHOWER HEAD
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Sep. 15, 1981, Ser. No. 302,586
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 1029 OB
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

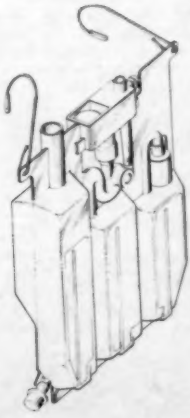
267,813
BATHTUB
William L. Lippert, Jr., Colgate, and Wayne M. Lippert, Wauwatosa, both of Wis., assignors to Lippert Corporation, Menomonee Falls, Wis.
Filed Apr. 7, 1980, Ser. No. 137,884
Term of patent 14 years
Int. Cl. D23—*07*
U.S. Cl. D23—55



267,814
PET NURSING NIPPLE
Irving Bressler, Brooklyn, N.Y., assignor to Four Paws Products, Ltd., Central Islip, N.Y.
Filed Aug. 1, 1980, Ser. No. 174,719
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D24—46



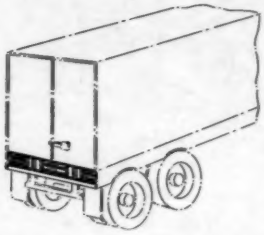
267,815
CHEST DRAINAGE BOTTLE
Donald P. Elliott, Denver; William L. Halseth, Parker, and William R. King, Lakewood, all of Colo., assignors to C. R. Bard Inc., Murray Hill, N.J.
Filed May 26, 1981, Ser. No. 266,981
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—59



267,816
HEAT LAMP STAND
Donald F. Tripp, 461 Butterfield, East Lansing, Mich. 48823
Filed Aug. 29, 1980, Ser. No. 182,776
Term of patent 14 years
Int. Cl. D24—*99*; D26—*05*
U.S. Cl. D24—68

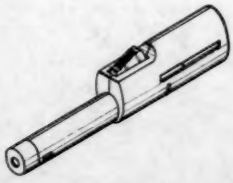
267,817
TRIPOD LADDER
Roger G. Garrett, 8518 Marklawn Dr., Richmond, Va. 23229
Filed Aug. 20, 1979, Ser. No. 68,256
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D25—63

267,818
COMBINED SIGNAL, EMERGENCY AND SAFETY WARNING LIGHT FOR TRUCKS
Robert W. Lynn, and Judith B. Lynn, both of 405 Faye La., Redondo Beach, Calif. 90277
Filed Jul. 8, 1980, Ser. No. 166,820
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—35



267,819
COMBINED INDUSTRIAL DIVER'S UNDERWATER LIGHT AND ULTRAVIOLET INSPECTION LIGHT
Jack Birns, 901 Malcolm Ave., Los Angeles, Calif. 90024
Filed Sep. 29, 1980, Ser. No. 192,091
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37

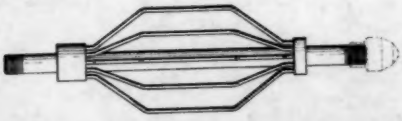
267,820
GAS LIGHTER
Suteo Tomita, Ichikawashi, Japan, assignor to Iwatani Sangyo Kabushiki Kaisha, Osaka, Japan
Filed Feb. 25, 1980, Ser. No. 124,272
Claims priority, application Japan, Sep. 25, 1979, 54-40472
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



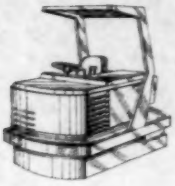
267,821
HAIR CURLER SET
Gordon T. Guth, Evanston; Douglas G. Long, Lombard, and Bernard B. Binestein, Des Plaines, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 12, 1981, Ser. No. 224,248
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—38

267,822
DOUBLE-ENDED COSMETIC CASE
Phillip Katz, Slope Rise, and Richard Sonnenblick, Malborough, both of N.J., assignors to Cosrich, Inc., Perth Amboy, N.J.
Filed Jan. 2, 1981, Ser. No. 222,520
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—86

267,823
SEWER LINE PROOFER TOOL
Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Co., Lima, Ohio
Filed Dec. 22, 1980, Ser. No. 218,569
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—14



267,824
FLOOR MAINTENANCE MACHINE
James P. Manneliy, Edina, Minn., assignor to Tennant Company, Minneapolis, Minn.
Filed Dec. 18, 1980, Ser. No. 217,775
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—16

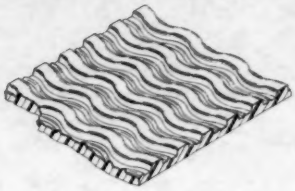


267,825
SNOW REMOVAL DEVICE FOR VEHICLES
James C. Samuels, 324 Pinecrest Rd., Springfield, Pa. 19064
Filed Oct. 7, 1980, Ser. No. 194,894
Term of patent 14 years
Int. Cl.[3] D7—*05*
U.S. Cl. D32—41

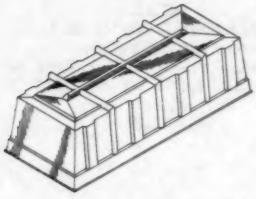
267,826
HAND SCRAPER
Donald Gringer, 1513 Olmstead Ave., Bronx, N.Y. 10462
Filed Nov. 19, 1980, Ser. No. 208,409
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—48

267,827
SPONGE APPLICATOR, OR THE LIKE
James R. Gross, Bartlett, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Oct. 9, 1980, Ser. No. 195,545
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—51

267,828
SHOE SOLE MATERIAL
Leon H. Cohen, 150 Gould St., Needham Heights, Mass. 02194
Filed Mar. 28, 1980, Ser. No. 134,851
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—32



267,829
VAULT DOME
Richard Cook, 624 10th Ave. North, Nampa, Id. 83651
Filed Aug. 8, 1980, Ser. No. 176,477
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D19—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF FEBRUARY, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Egerton Limited: *See—*
Thompson, Roy F., 4,371,578, Cl. 428-192.000.

A/S Ferrosan: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

A. Schulman, Inc.: *See—*
Nelson, Wayne F., 4,371,583, Cl. 428-358.000.

AB Bonnierforetagen: *See—*
Gustafsson, Berth U., 4,371,324, Cl. 418-201.000.

AB Carbox: *See—*
Adolfsson, Rune; Persson, Gert A.; and Persson, Hans A. H., 4,370,880, Cl. 72-389.000.

AB Strangbetong: *See—*
Bernander, Karl-Gustav; and Skogstrom, Lars, 4,371,031, Cl. 165-54.000.

Abbott Laboratories: *See—*
Choudhury, Hrishikesh; and Zaha, Juergen H., 4,370,992, Cl. 134-100.000.
Plattner, Jacob J.; Pernet, Andre G.; and Fung, Anthony K., 4,371,546, Cl. 424-330.000.

Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, to Honeywell Inc. Ni-fe thin-film temperature sensor. 4,371,861, Cl. 338-25.000.

Abedor, Allan J.; and Abedor, John L. Token sensing photodetector actuated electronic control and timing device and method of use. 4,371,071, Cl. 194-4.00R.

Abedor, John L.: *See—*
Abedor, Allan J.; and Abedor, John L., 4,371,071, Cl. 194-4.00R.

Aberg, Kjell U.: *See—*
Astero , Ulf J. E.; Dahlberg, Johan A. F.; and Aberg, Kjell U., 4,371,155, Cl. 270-53.000.

Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., to Otis Engineering Corporation; and Exxon Production Research Company. Apparatus and method for injecting fluid into a well. 4,371,038, Cl. 166-380.000.

Abraham, Fayez F., to Tyler Refrigeration Corporation. Removable duct panel for multiband refrigerated display cases. 4,370,866, Cl. 62-256.000.

Abrams, Joseph L.: *See—*
Maynard, Arthur D.; and Abrams, Joseph L., 4,371,779, Cl. 219-328.000.

Acevedo, Francisco, to Commonwealth of Puerto Rico. Alignment game with cross shaped playing field. 4,371,170, Cl. 273-271.000.

ACF Industries, Incorporated: *See—*
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,371,303, Cl. 414-281.000.

Achelpohl, Fritz; and Decker, Werner, to Windmoller & Holscher. Apparatus for pulling open tube sections to form base squares in the production of cross-bottom sacks. 4,371,367, Cl. 493-256.000.

Achterholt, Rainer. Automatic switching-off arrangement. 4,371,051, Cl. 180-271.000.

Acker, Rolf-Dieter; Koenig, Karl-Heinz; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Silyl-benzimidazole-2-carbamic acid esters and their use as fungicides. 4,371,525, Cl. 424-184.000.

Acumeter Laboratories, Inc.: *See—*
McIntyre, Donald B.; and McIntyre, Frederic S., 4,371,571, Cl. 427-285.000.

Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., to United Technologies Corporation. Attitude trimmed airspeed/attitude controls. 4,371,936, Cl. 364-434.000.

Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., to United Technologies Corporation. Retaining airspeed hold engagement in low speed maneuver. 4,371,937, Cl. 364-434.000.

Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., to United Technologies Corporation. Roll attitude inhibit of aircraft coordinated turn disengagement. 4,371,939, Cl. 364-434.000.

Adams, Don L.: *See—*
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,371,938, Cl. 364-434.000.

Adams, John H., to Reuters Limited. Alert message communication system. 4,371,871, Cl. 340-717.000.

Adbar (Patent Co.) Limited: *See—*
Ringham, Stanley A., 4,371,300, Cl. 411-41.000.

Adeka Argus Chemical Co. Ltd.: *See—*
Minagawa, Motonobu; and Nakahara, Yutaka, 4,371,646, Cl. 524-119.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Tobita, Etsuo, 4,371,647, Cl. 524-120.000.

Adolfsson, Rune; Persson, Gert A.; and Persson, Hans A. H., to AB Carbox. Method and apparatus for bending sheet-plate blanks to form shells having cylindrical curvature. 4,370,880, Cl. 72-389.000.

Adriel Energy Corporation: *See—*
Weinberger, Theodore, 4,371,377, Cl. 44-56.000.

Aeromator Trading Co. AB: *See—*
Bernander, Karl-Gustav; and Skogstrom, Lars, 4,371,031, Cl. 165-54.000.

Agarwal, Pawan K.; and Makowski, Henry S., to Exxon Research and Engineering Co. Hot melt adhesive compositions. 4,371,640, Cl. 524-66.000.

Agarwal, Pawan K., to Exxon Research and Engineering Co. Blend compounds of sulfonated polymers and compositions thereof. 4,371,652, Cl. 524-216.000.

Agence Nationale de Valorisation de la Recherche: *See—*
Doyen, Joel; and Raisin, Jean-Pierre, 4,371,159, Cl. 271-228.000.

Agency of Industrial Science and Technology: *See—*
Shimizu, Kazuo, 4,371,729, Cl. 585-453.000.
Takada, Susumu, 4,371,796, Cl. 307-476.000.

Agency of Industrial Science & Technology Ministry of International Trade & Industry: *See—*
Yamamoto, Noboru; and Yamashita, Iwao, 4,371,686, Cl. 528-76.000.

Agfa-Gevaert AG: *See—*
Dietrich, Karl-Heinz; Gruber, Josef; Rauffer, Walter; and Nasul, Peter, 4,371,242, Cl. 353-101.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
von Kempski, Walter; and Kirstein, Fritz, 4,371,196, Cl. 283-7.000.

Agfa-Gevaert, N.V.: *See—*
Van de Sande, Christian C.; Janssens, Wilhelmus; Lanig, Wolfgang; and Meier, Ernst, 4,371,604, Cl. 430-223.000.

Ahne, Hellmut; Kuhn, Eberhard; and Rubner, Roland, to Siemens Aktiengesellschaft. Radiation-reactive precursor stages of highly heat-resistant polymers. 4,371,685, Cl. 528-73.000.

Ahrens, Wilhelm: *See—*
Fock, Jurgen; Schedlitzki, Dietmar; Holtschmidt, Ulrich; and Ahrens, Wilhelm, 4,371,683, Cl. 528-60.000.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Control system for a continuously operating press. 4,371,414, Cl. 156-361.000.

Aichelmann, Dietmar; Kannenberg, Karl; Schutte, Dieter; and Volling, Axel. Apparatus for the vaporization of aluminum trichloride. 4,371,503, Cl. 422-307.000.

Air Products and Chemicals, Inc.: *See—*
Lovette, Norris G., Jr.; and Ruprecht, David R., 4,370,861, Cl. 62-63.000.

Airhart, Harold, Sr.: *See—*
Willig, Roy L.; LeBlanc, Edward J., III; and Airhart, Harold, Sr., 4,371,044, Cl. 175-4.600.

Aisan Kogyo Kabushiki Kaisha: *See—*
Wada, Satomi, 4,371,478, Cl. 261-44.00C.

Aisin Seiki Company, Limited: *See—*
Iwasaki, Shinichiro, 4,371,272, Cl. 374-184.000.

Aitken, Robert M., to Imperial Chemical Industries Limited. Method and apparatus for the manufacture of fusecord. 4,371,368, Cl. 493-298.000.

Aizawa, Hiroshi: *See—*
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.

Ajinomoto Co., Inc.: *See—*
Anderson, David M.; Herrmann, Klaus M.; and Somerville, Ronald L., 4,371,614, Cl. 435-108.000.
Miwa, Kiyoshi; and Momose, Haruo, 4,371,615, Cl. 435-115.000.
Utagawa, Takashi; Miyoshi, Takeshi; Morisawa, Hirokazu; Yamazaki, Akihiro; Yoshinaga, Fumihiro; and Mitsugi, Koji, 4,371,613, Cl. 435-88.000.

Ajinomoto Co., Ltd.: *See—*
Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, 4,371,577, Cl. 428-96.000.

Akebono Brake Industry Co., Ltd.: *See—*
Iwata, Yoichi, 4,371,060, Cl. 188-73.380.

Akimoto, Hiroshi; and Kawai, Akiyoshi, to Takeda Chemical Industries, Ltd. 4,5-Deoxymaytansinoids, their use and pharmaceutical compositions thereof. 4,371,533, Cl. 424-248.540.

Akino, Miki: *See—*
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.

Akita, Sigeyuki: *See—*
Kago, Yoshiyuki; Akita, Sigeyuki; and Fujikawa, Katsuhisa, 4,371,835, Cl. 324-174.000.

Aktiebolaget Bofors: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,370,915, Cl. 89-47.000.

Akzona Incorporated: *See*—
Mathes, Nikolaus; Pitowski, Hans J.; and Vitzthum, Gunther, 4,371,441, Cl. 210-649.000.
Mathes, Nikolaus; Lange, Wolfgang; and Gerlach, Klaus, 4,371,485, Cl. 264-46.100.

Albrile, Walter, to Ing. C. Olivetti & C., S.p.A. Selector system for a single type carrier in typewriters and similar printing machines. 4,371,275, Cl. 400-161.300.

Alekhin, Stanislav A.; Bakhir, Vitold M.; Born, Raisa I.; and Bakhir, Tatyana M. Method for controlling the dispersing of solids in drilling mud. 4,370,885, Cl. 73-153.000.

Alessio, Lorenzo E.; and Cuneo, Giuseppe, to Black & Decker Inc. Overspeed protective apparatus for a portable tool. 4,371,906, Cl. 361-51.000.

Alexiou, Michael S.; Brittain, Philip I.; and Tyman, John H. P., to Brent Chemicals International Limited. Aromatic compounds and their manufacture. 4,371,694, Cl. 546-100.000.

Alford, Derek; and Wilkinson, Alan, to Coal Industry (Patents) Limited. Mining machine steering equipment. 4,371,209, Cl. 299-1.000.

Alicot, Michel J. C.; and Tignol, Adrien P. N., to P C U K Produits Chimiques Ugine Kuhlmann. Process for the purification of mercaptobenzothiazole. 4,371,698, Cl. 548-177.000.

Alix, Maurice A. J. Tension stop for safety belt of the inertia reel type. 4,371,192, Cl. 280-801.000.

Allcraft Plastic Company, Inc.: *See*—
Heil, John, 4,370,762, Cl. 4-206.000.

Allied Corporation: *See*—
Eibeck, Richard E.; Robinson, Martin A.; Evans, Francis E.; and Recla, Eugene B., 4,371,707, Cl. 568-6.000.
Marshall, Robert M.; and Dardoufas, Kimon C., 4,371,658, Cl. 524-585.000.

Allis-Chalmers Corporation: *See*—
Hansen, Kenneth N., 4,371,048, Cl. 180-69.00R.
Wagner, Robert J., 4,370,829, Cl. 49-388.000.

Alt, Gerhard H.; and Chupp, John P., to Monsanto Company. Process for the in-solvent, in-situ generation of haloalkyl alkyl ethers. 4,371,717, Cl. 568-681.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,371,621, Cl. 435-191.000.

American Can Company: *See*—
Sieverin, Walter J., 4,371,837, Cl. 324-225.000.

American Cyanamid Co.: *See*—
Thomas, Daniel W., 4,371,643, Cl. 524-88.000.

American Home Products Corporation: *See*—
McGregor, William H., 4,371,465, Cl. 260-112.50R.
McGregor, William H., 4,371,466, Cl. 260-112.50R.
Stein, Reinhardt P., 4,371,539, Cl. 424-272.000.
Stein, Reinhardt P., 4,371,697, Cl. 548-125.000.

American Industries, Inc.: *See*—
Carlo, Louis D., 4,370,897, Cl. 74-475.000.

American Pneumatics Co.: *See*—
Donzis, Byron A., 4,370,754, Cl. 2-2.000.

American Safety Equipment Corp.: *See*—
Tanaka, Akira, 4,371,128, Cl. 242-107.40A.

AMSTED Industries Incorporated: *See*—
Mulcahy, Harry W., 4,370,933, Cl. 105-197.0DB.

Anagnostopoulos, Constantine N.; and Ranadive, Deepak K., to Eastman Kodak Company. Tapering of oxidized polysilicon electrodes. 4,371,890, Cl. 357-59.000.

Anderson, Burton C.; and Frazer, August H., to Du Pont de Nemours, E. I., and Company. Heat-resistant rigid polymers from difunctional 9,10-dihydro-9,10-ethanoanthracenes. 4,371,690, Cl. 528-190.000.

Anderson, David M.; Herrmann, Klaus M.; and Somerville, Ronald L., to Ajinomoto Co., Inc. *E.Coli* bacteria carrying recombinant plasmids and their use in the fermentative production of L-tryptophan. 4,371,614, Cl. 435-108.000.

Anderson, Kenneth L., to Phillips Petroleum Company. Controlled, elevated pressure dehydration of poly(arylene sulfide) prepolymerization mixture. 4,371,671, Cl. 528-388.000.

Andersson, Hans: *See*—
Bator, Tadeusz, 4,371,917, Cl. 363-21.000.

Ando, Hirohito; and Furukawa, Naoki, to Dainippon Ink and Chemicals Inc. Process for producing isoindolinone pigments. 4,371,467, Cl. 260-165.000.

Ando, Makoto: *See*—
Kikuchi, Toshiro; Ogawa, Masaru; and Ando, Makoto, 4,371,620, Cl. 435-189.000.

Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, to Toto, Ltd. Topical washing device. 4,370,764, Cl. 4-443.000.

Ando, Takayuki: *See*—
Shimogawa, Toshiaki; Ando, Takayuki; and Kuwakado, Satosi, 4,371,127, Cl. 242-107.200.

Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, to Japan Atomic Energy Research Institute; and Hitachi Cable, Ltd. Composite superconductors. 4,371,741, Cl. 174-15.00S.

Andow, Fumio; Kobayashi, Takayuki; Kondow, Ryotaro; and Nii, Yoshiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital protective relaying systems. 4,371,908, Cl. 361-83.000.

Andres, Rudolf; and Grantz, Helmut, to Daimler-Benz A.G. Safety belt system. 4,371,125, Cl. 242-107.000.

Andrews, Michael W.; and Hoffmann, Carl J., to Bell Telephone Laboratories, Incorporated. Load distribution among parallel DC-DC converters. 4,371,919, Cl. 363-65.000.

Anglade, Rene. Guardrailing for vehicles. 4,371,056, Cl. 182-127.000.

Annen, Klaus: *See*—
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.

Anscher, Bernard. Wire bundle clamp. 4,371,137, Cl. 248-73.000.

Anthony, Myron L., to Sax Zzyzx, Ltd. Latent heat recirculating system. 4,371,424, Cl. 202-159.000.

Apollo Molded Products: *See*—
Gelina, Robert P., 4,371,091, Cl. 220-288.000.

Apple Computer, Inc.: *See*—
Muller, Michael, 4,371,760, Cl. 200-5.00A.

Applied Magnetics Corporation: *See*—
Platter, Sanford; and Shelley, Pierre, 4,370,802, Cl. 29-603.000.
Roscamp, Thomas A.; and Gibson, George W., 4,370,801, Cl. 29-603.000.

Aqualume, Incorporated: *See*—
Campagna, Thomas G., 4,371,023, Cl. 152-158.000.

Araki, Kaeko, administratrix: *See*—
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased, 4,370,804, Cl. 29-741.000.

Araki, Shigeru, deceased: *See*—
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased, 4,370,804, Cl. 29-741.000.

Arata, Tetsuya: *See*—
Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, 4,371,319, Cl. 417-312.000.

Arkoudilos, John: *See*—
Siregar, John A.; and Arkoudilos, John, 4,371,558, Cl. 426-332.000.

Armstrong, Donald E.: *See*—
Broadt, David R.; Armstrong, Donald E.; and Kackenmeister, Carl F., 4,371,914, Cl. 362-15.000.

Arnaud, Claude B., to Societe Anonyme Dite: Corneloup S.A. Grape harvester. 4,370,847, Cl. 56-330.000.

Arnaudeau, Marcel, to Institut Francais du Petrole. Transfer terminal for offshore production. 4,371,037, Cl. 166-366.000.

Arnold, Victor. Device for repairing poles for supporting electric power transmission lines and the like. 4,371,018, Cl. 144-4.000.

Arnold, William T., to Brouwer Turf Equipment Limited. Gang mower with single cylinder lifting mechanism. 4,370,846, Cl. 56-6.000.

Aronica, John A., to Kendall Company, The. Belt retainer. 4,370,782, Cl. 24-198.000.

Art Cap Company, Inc.: *See*—
Gallin, Paul G., 4,370,756, Cl. 2-195.000.

Artos Engineering Company: *See*—
Butler, John D., 4,370,786, Cl. 29-33.00M.

Asao, Tomohiro; and Takahashi, Yosuke, to Yanmar Diesel Engine Co., Ltd. Apparatus for starting internal combustion engine. 4,370,954, Cl. 123-182.000.

ASEA Aktiebolag: *See*—
Larsson, Hans G.; and Westman, Erik, 4,371,396, Cl. 419-56.000.

Ashland Food Technology Holdings S.A.: *See*—
Becker, Heinz, 4,371,554, Cl. 426-243.000.

Ashland Oil, Inc.: *See*—
Gardikes, John J.; and Kim, Young D., 4,371,648, Cl. 523-144.000.

Ashton, Larry J.; and Grimes, Ronald R., to Little Giant Industries, Inc. Method of manufacturing a fiberglass ladder. 4,371,055, Cl. 182-46.000.

Assaf, Gad, to Bronicki, Lucien Y., a part interest. Method of and means for lifting water and generating power therefrom. 4,370,859, Cl. 60-641.600.

Assaf, Gad, to Solmat. Method of and means for generating power from a hot brine source. 4,370,860, Cl. 60-641.110.

Assenza, Donello; and Pappalardo, Massimo, to Consiglio Nazionale Delle Ricerche. Method for making ultracoustic transducers of the line curtain or point matrix type. 4,370,785, Cl. 29-25.350.

Astero , Ulf J. E.; Dahlberg, Johan A. F.; and Aberg, Kjell U., to Asthausbolagen HB Astero & Stockhaus. Apparatus for jogging a sheaf of papers. 4,371,155, Cl. 270-53.000.

Asthausbolagen HB Astero & Stockhaus: *See*—
Astero , Ulf J. E.; Dahlberg, Johan A. F.; and Aberg, Kjell U., 4,371,155, Cl. 270-53.000.

Atkins, Robert C. Nipple waterer. 4,370,948, Cl. 119-72.500.

Atlantic Richfield Company: *See*—
Bi, Le-Khac, 4,371,670, Cl. 525-342.000.
Bourland, Larry G., 4,371,666, Cl. 525-207.000.
Lewis, Kathy; and Avery, James E., 4,371,739, Cl. 136-251.000.
Nicholson, Harold L., 4,371,661, Cl. 525-53.000.
Younes, Usama E., 4,371,672, Cl. 525-391.000.

Atlas Powder Company: *See*—
Fillman, Harold T., 4,371,408, Cl. 149-21.000.

Audesse, Emery G.: *See*—
Broadt, David R.; and Audesse, Emery G., 4,371,913, Cl. 362-17.000.

Aurora Industries, Inc.: *See*—
Hentz, Donald A., 4,371,626, Cl. 501-145.000.

Aust, John J.: *See*—
Bower, Thomas E.; and Aust, John J., 4,371,366, Cl. 493-138.000.

Austin, Thomas H., to Texaco Inc. Preparation of a semiflexible energy management polyether polyurethane foam using as a crosslinker-surfactant an ethylene oxide adduct of a Mannich condensate prepared

from the reaction of nonyl phenol, diethanolamine and formaldehyde. 4,371,629, Cl. 521-115.000.

Autelca AG: *See*—
Dubey, Pierre, 4,371,073, Cl. 194-102.000.

Automobiles Citroen S.A.: *See*—
Dore, Jacques P., 4,371,356, Cl. 464-111.000.

Automobiles Peugeot: *See*—
Dore, Jacques P., 4,371,356, Cl. 464-111.000.

Avco Corporation: *See*—
McNair, Robert J., Jr., 4,370,959, Cl. 123-295.000.

Avery, James E.: *See*—
Lewis, Kathy; and Avery, James E., 4,371,739, Cl. 136-251.000.

Awerbuch, Leon; and Rogers, Alfred N., to Bechtel International Corporation. Apparatus and method for energy production and mineral recovery from geothermal and geopressured fluids. 4,370,858, Cl. 60-641.500.

B. F. Goodrich Company, The: *See*—
Kroenke, William J., 4,371,655, Cl. 524-423.000.
Mattson, William F., 4,371,483, Cl. 264-40.600.
Morningstar, Marion G.; and Doyle, Thomas J., 4,371,677, Cl. 526-80.000.

Baba, Nobuyuki: *See*—
Watanabe, Kazutomi; Iwasaki, Sokichi; and Baba, Nobuyuki, 4,370,943, Cl. 118-218.000.

Bader, Ilse: *See*—
Lind, Erwin; and Bader, Ilse, 4,371,599, Cl. 430-49.000.

Badet, Bernard; and Kurzweil, Karel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Substrate for interconnecting electronic integrated circuit components having a repair arrangement enabling modification of connections to a mounted chip device. 4,371,744, Cl. 174-68.500.

Badura, Wolfgang: *See*—
Steinicke, Wolfgang; Badura, Wolfgang; Schiessl, Alois; Weinzierl, Werner; and Krone, Hartmut, 4,370,929, Cl. 102-202.000.

Bagnall, Michael: *See*—
Gordiski, Ronald J.; Bennett, Robert G., Jr.; Parrella, Alfred T.; and Bagnall, Michael, 4,371,941, Cl. 364-475.000.

Bahr, Gunter; Habel, Erich; and Hafner, Werner, to Carl Freudenberg, Firma. Self-locking sealing and wiper ring. 4,371,177, Cl. 277-152.000.

Baise, Arnold I.; Burns, John M.; and Sachdev, Harbans S., to International Business Machines Corporation. Process for adhering an organic resin to a substrate by means of plasma polymerized phosphines. 4,371,565, Cl. 427-41.000.

Baker, Archibald J. S., to Cross Manufacturing Company Limited. Method of lining cylindrical bores. 4,370,788, Cl. 29-156.4WL.

Baker, Basil O., to M-O Valve Company Limited, The. Excess voltage arresters. 4,371,911, Cl. 361-124.000.

Baker Perkins Holdings Limited: *See*—
Steels, Gordon, 4,371,329, Cl. 425-437.000.

Bakhir, Tatyana M.: *See*—
Alekhin, Stanislav A.; Bakhir, Vitold M.; Born, Raisa I.; and Bakhir, Tatyana M., 4,370,885, Cl. 73-153.000.

Bakhir, Vitold M.: *See*—
Alekhin, Stanislav A.; Bakhir, Vitold M.; Born, Raisa I.; and Bakhir, Tatyana M., 4,370,885, Cl. 73-153.000.

Balko, Edward N.; and Moulthrop, Lawrence C., to General Electric Company. Apparatus for reduction of shunt current in bipolar electrochemical cell assemblies. 4,371,433, Cl. 204-228.000.

Ball Corporation: *See*—
Scholes, Addison B., 4,371,387, Cl. 65-118.000.

Balland, Jean, to Manufacture de Produits Chimiques Protex. Chloride oxidation of dyes in vat and sulfur dyed textiles. 4,371,373, Cl. 8-650.000.

Ballard, James W.; and Ballard, Larry R. Methods of constructing a one-piece roof vent device. 4,370,876, Cl. 72-68.000.

Ballard, Larry R.: *See*—
Ballard, James W.; and Ballard, Larry R., 4,370,876, Cl. 72-68.000.

Ballarini, John A.; and Hetland, Timothy A., to Printing Developments, Inc. Electrodeposition of chromium on metal base lithographic sheet. 4,371,430, Cl. 204-32.00R.

Bally Manufacturing Corporation: *See*—
Halliburton, Ronald D., 4,371,164, Cl. 273-121.00A.

Balogh, George F., to Goodyear Tire & Rubber Company, The. Purification of hydrocarbons by treatment with polyamines. 4,371,733, Cl. 585-860.000.

Bals, Hans G. Two-wheeled vehicle. 4,371,185, Cl. 280-227.000.

Bals, Hans G., to Uranerzbergbau GmbH & Co. KG. Method for obtaining dissolved suspended or chemically bound substances from a liquid. 4,371,442, Cl. 210-661.000.

Ban, Hiromichi: *See*—
Takeuchi, Osamu; Kokubun, Haruo; Yoshinaga, Hisashi; Hara, Shuichi; and Ban, Hiromichi, 4,371,149, Cl. 266-90.000.

Baranowski, Leonard J.: *See*—
Lee, Richard J.; and Baranowski, Leonard J., 4,371,712, Cl. 568-430.000.

Baratoff, Paul, to Korfund Dynamics Corporation. Vibration isolation system with adjustable constant force, all-directional, attenuating seismic restraint. 4,371,141, Cl. 248-569.000.

Bard, William B.; and Walters, John O., to Phillips Petroleum Company. Control of a fluid catalytic cracking unit. 4,371,499, Cl. 422-111.000.

Barendregt, Willem, to Internationale Verpakking Maatschappij BV. Container closure. 4,371,089, Cl. 215-256.000.

Barkalow, Richard H.: *See*—
Goebel, Joseph A.; Barkalow, Richard H.; and Ulion, Nicholas E., 4,371,570, Cl. 427-248.100.

Barlow, George J.; Stanley, Philip E.; and Brown, Richard P., to Honeywell Information Systems Inc. Interface for controlling information transfers between main data processing systems units and a central subsystem. 4,371,928, Cl. 364-200.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,370,853, Cl. 57-340.000.
Lohest, Hans, 4,371,823, Cl. 318-705.000.
Oberstrass, Detley, 4,370,851, Cl. 57-340.000.
Oberstrass, Detley; Hartig, Wolfgang; and Weber, Klaus, 4,370,852, Cl. 57-340.000.

Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., to MacMillan Bloedel Limited. Three-step process for preparation of long wood strands. 4,371,020, Cl. 144-366.000.

Barnes, Stuart R., to International Standard Electric Corporation. Injection mold for coaxial cable jointing. 4,371,145, Cl. 249-80.000.

Barraclough, Bruce L.: *See*—
McGuire, Patrick L.; and Barraclough, Bruce L., 4,371,045, Cl. 175-17.000.

Barta, Istvan: *See*—
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.

Bartels-Keith, James R.; and Karger, Eva R., to Polaroid Corporation. Amino hydroxy cyclohexenone developing agents. 4,371,603, Cl. 430-218.000.

Barthel, Walter: *See*—
Muller, Karl-Hans; and Barthel, Walter, 4,371,400, Cl. 136-273.00R.

Bartusel, Karl R.: *See*—
Siemens, Walter; Ulrich, Gunther; and Bartusel, Karl R., 4,371,103, Cl. 225-1.000.

BASF Aktiengesellschaft: *See*—
Acker, Rolf-Dieter; Koenig, Karl-Heinz; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,371,525, Cl. 424-184.000.
Distler, Dieter; Wolf, Hans; and Welzel, Gerhard, 4,371,636, Cl. 523-223.000.
Druschke, Wolfgang; Kerckow, Albrecht; and Stanger, Bernd, 4,371,659, Cl. 524-599.000.
Hoene, Richard, 4,371,676, Cl. 526-76.000.
Hoffman, Dietrich; and Sliwka, Wolfgang, 4,371,634, Cl. 523-208.000.
Scherer, Hans; Lotsch, Wolfgang; and Bock, Gustav, 4,371,735, Cl. 544-300.000.
Seybold, Guenther, 4,371,734, Cl. 544-300.000.

BASF Farben & Fasern AG: *See*—
Moller, Dieter; and Poth, Ulrich, 4,371,667, Cl. 525-208.000.

BASF Wyandotte Corporation: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,371,476, Cl. 260-709.000.

Bassetti S.p.A.: *See*—
Carreras Fontcuberta, Francisco, 4,370,939, Cl. 112-262.200.

Bator, Tadeusz, to Wladimiroff, Wladimir; and Andersson, Hans. Voltage conversion method. 4,371,917, Cl. 363-21.000.

Bauer, Karl; Schippers, Heinz; and Dammann, Peter, to Barmag Barmer Maschinenfabrik AG. Friction false twisting apparatus. 4,370,853, Cl. 57-340.000.

Baumann, Gunther: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Baumann, Hans D. Flexible and backlash free rotary stem coupling. 4,371,355, Cl. 464-101.000.

Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., to International Business Machines Corporation. Disk initialization method. 4,371,902, Cl. 360-75.000.

Baxter, Warren N.; Merckling, Nicholas G., deceased; by Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., to Du Pont de Nemours, E. I., and Company. Polymer composition. 4,371,680, Cl. 526-159.000.

Bayer Aktiengesellschaft: *See*—
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, 4,371,691, Cl. 528-196.000.
Konig, Klaus; Illger, Hans-Walter; Seifert, Peter; and Meyborg, Holger, 4,371,630, Cl. 521-173.000.
Kramer, Wolfgang; and Elbe, Hans-Ludwig, 4,371,708, Cl. 568-31.000.
Kranz, Eckart, 4,371,700, Cl. 548-262.000.
Quiring, Bernd; Niederdellmann, Georg; Goyert, Wilhelm; and Wagner, Hans, 4,371,684, Cl. 528-65.000.

Bazell, Seymour; and Goldberg, Edward M. Medical fluid collection device. 4,370,987, Cl. 128-760.000.

BBC Brown, Boveri & Company Limited: *See*—
Huser, Guido, 4,371,766, Cl. 200-148.00A.
Mercier, Olivier, 4,371,791, Cl. 307-141.000.
Ragaller, Klaus, 4,371,765, Cl. 200-147.00R.

Beaty, Ronald L.: *See*—
Mitrovich, Svetislav; and Beaty, Ronald L., 4,371,276, Cl. 400-625.000.

Bechtel International Corporation: *See*—
Awerbuch, Leon; and Rogers, Alfred N., 4,370,858, Cl. 60-641.500.

Beck, Gerhard; Knolle, Jochen; Rupp, Richard H.; and Scholkens, Bernward, to Hoechst Aktiengesellschaft. Hetero-imino-prostacyclins. 4,371,542, Cl. 424-274.000.

Becker, Floyd W.; and Regimbal, Richard R., to Drill Systems, Inc. Multi-purpose mobile drill rig. 4,371,041, Cl. 173-28.000.

Becker, Heinz, to Ashland Food Technology Holdings S.A. Method of making skinless sausage using reusable porous polytetrafluoroethylene casing. 4,371,554, Cl. 426-243.000.

Becker, Heinz: *See*—
Grunert, Hans C.; and Becker, Heinz, 4,371,223, Cl. 312-325.000.

Beckett, Ardell. Waste heat recovery system. 4,370,949, Cl. 122-20.00B.

Beckschulte, Heinrich; and Schluter, Wilhelm, to Gebruder Lodige Maschinenbau Gesellschaft mit beschrankter Haftung. Method for gluing of particles containing chips, fibers and similar ligno-cellulose-containing particles and apparatus for this purpose of gluing the same. 4,370,945, Cl. 118-303.000.

Beery, Jack, to Xerox Corporation. Programmed brake for controlling the speed of a scanning carriage. 4,371,254, Cl. 355-8.000.

Behar, Abraham. Connection between two bodies. 4,371,285, Cl. 403-339.000.

Beilfuss, Wolfgang: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,371,547, Cl. 424-333.000.

Bell, Robert P.: *See*—
Sibley, Clifton B.; and Bell, Robert P., 4,371,502, Cl. 422-249.000.

Bell Telephone Laboratories, Incorporated: *See*—
Andrews, Michael W.; and Hoffmann, Carl J., 4,371,919, Cl. 363-65.000.
Brolin, Stephen J., 4,371,755, Cl. 179-35.000.
Chen, I-Heng; and Liss, Warren A., 4,371,789, Cl. 307-38.000.
Fang, San-Chin; and Fraser, Donald L., Jr., 4,371,843, Cl. 330-253.000.
Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., 4,371,886, Cl. 357-38.000.
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., 4,371,887, Cl. 357-38.000.
Ulrich, Werner, 4,371,758, Cl. 179-175.20C.

Bellet, Jean-Marie, to Bioself International Inc. Electronic thermometer. 4,371,271, Cl. 374-183.000.

Belton, Betty R. Apparatus for batiking eggs and the like. 4,370,941, Cl. 118-13.000.

Benai, Tommaso; Leoncini, Novello; and Paoletti, Ugo, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the continuous spinning of viscose rayon. 4,371,491, Cl. 264-196.000.

Benattar, Robert; and Cronenberger, Michel, to SODIP. Fluid treatment apparatus, a casing for enclosing and compressing a stack of flat elements therein, and a process for making such an apparatus. 4,371,438, Cl. 210-232.000.

Bendix Corporation, The: *See*—
Lorraine, Jack R., 4,371,322, Cl. 418-47.000.

Benkmann, Christian, to Linde Aktiengesellschaft. Pressure swing adsorption process. 4,371,380, Cl. 55-26.000.

Bennet, Joseph C.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,370,806, Cl. 29-749.000.

Bennett, Robert A.: *See*—
Henriques, Joseph; and Bennett, Robert A., 4,370,920, Cl. 99-339.000.

Bennett, Robert G., Jr.: *See*—
Gordiski, Ronald J.; Bennett, Robert G., Jr.; Parrella, Alfred T.; and Bagnall, Michael, 4,371,941, Cl. 364-475.000.

Benson, Melvin E.: *See*—
McCaskey, Harold O.; and Benson, Melvin E., 4,371,579, Cl. 428-204.000.

Bentzen, Craig L.; Nguyen Mong, Lan; and Niesor, Eric, to Symphar S.A. Therapeutic process with diphosphonate compounds. 4,371,527, Cl. 424-204.000.

Berge, Charles T.: *See*—
Mack, Mark P.; and Berge, Charles T., 4,371,455, Cl. 252-429.00C.

Berger, Martin M. Vending machine with convertible shelves. 4,371,093, Cl. 221-90.000.

Bergvall, Bengt A., to Husqvarna Aktiebolag. Electronic sewing machine with stitch control dependent on sewing material. 4,370,938, Cl. 112-158.00E.

Bernander, Karl-Gustav; and Skogstrom, Lars, to Aeromator Trading Co. AB; and AB Strangbetong. Arrangement for air conditioning control in buildings. 4,371,031, Cl. 165-54.000.

Bernelin, Daniel; and Meyer, Jacques, to Rhone-Poulenc Industries. Binder compositions for powder coatings from mixed saturated resins. 4,371,638, Cl. 523-427.000.

Berstein, Garri; and Riedel, Walter, to Wilhelm Hegenscheidt Gesellschaft mbH. Cutting tool for internal and external turning operations. 4,371,296, Cl. 407-115.000.

Bertram, Billy B.: *See*—
Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., 4,371,038, Cl. 166-380.000.

Besedin, Ivan A.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.

Best, Michael J. A.: *See*—
Morrill, Charles D.; and Best, Michael J. A., 4,371,005, Cl. 138-89.000.

Betts, Joseph E.; and Holub, Fred F., to General Electric Company. Method of improving the electrical properties of polymeric insulations containing polar additives, and the improved polymeric insulation product thereof. 4,371,653, Cl. 524-268.000.

Bezard, Jean-Jacques; and Delevallee, Bernard A., to Jaeger. Device for measuring the frequency of an electrical current representative of a variable quantity. 4,371,834, Cl. 324-167.000.

Bezzub, Grigory I.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Bi, Le-Khac, to Atlantic Richfield Company. Copolymers having a backbone of alternating polymer blocks and silicon units. 4,371,670, Cl. 525-342.000.

Biard, James R.; and Elmer, Ben R., to Spectronics, Inc. Data transmission link. 4,371,847, Cl. 330-307.000.

Bicknell, Thomas J.: *See*—
Constantinides, Nicholas J.; and Bicknell, Thomas J., 4,371,946, Cl. 364-822.000.

Bien, Alfred A.; and Heidt, Frederick W., to Multifastener Corporation. Clinch nut and method of installing same. 4,370,794, Cl. 29-509.000.

Bienert, Herbert; Hanselmann, Dieter; Kohler, Alfred; and Prohaska, Hans, to ITT Industries, Inc. Windshield wiper assembly. 4,370,774, Cl. 15-250.200.

Biferno, Michael A., to McDonnell Douglas Corporation. Fail transparent LCD display with backup. 4,371,870, Cl. 340-716.000.

Bignell, Allan M., to Westinghouse Canada Inc. Protective relay apparatus and methods for protecting electrical power transmission lines. 4,371,907, Cl. 361-82.000.

Billet, Rene, to VALEO Societe Anonyme. Clutch release bearings. 4,371,068, Cl. 192-98.000.

Bintig, Werner; and Christgau, Hermann, to Siemens Aktiengesellschaft. Luminescent screen with grid structure for X-ray image intensifier. 4,371,806, Cl. 313-101.000.

Bioself International Inc.: *See*—
Bellet, Jean-Marie, 4,371,271, Cl. 374-183.000.

Birmelin, Jorg: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Bis, Richard F.: *See*—
Morris, Hayden; and Bis, Richard F., 4,371,882, Cl. 357-4.000.

Bisbee, Charles B.; and Yost, Richard J., to Combustion Engineering, Inc. Insulation anchor. 4,370,840, Cl. 52-410.000.

Bither, Tom A., Jr., to Du Pont de Nemours, E. I., and Company. Vapor phase oxidation of n-butane to maleic anhydride. 4,371,702, Cl. 549-260.000.

Black & Decker Inc.: *See*—
Alessio, Lorenzo E.; and Cuneo, Giuseppe, 4,371,906, Cl. 361-51.000.
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,370,997, Cl. 137-116.300.

Blakeway Marviroll Pools Pty. Ltd.: *See*—
Blakeway, Stanley R., 4,370,839, Cl. 52-169.700.

Blakeway, Stanley R., to Blakeway Marviroll Pools Pty. Ltd. Pool construction. 4,370,839, Cl. 52-169.700.

Blanchard, Clarence E., to Outboard Marine Corporation. Mounting for marine propulsion device located aft of boat transom. 4,371,348, Cl. 440-52.000.

Blier, Daniel, to 100426 Canada Ltee. Telescopic scaffold. 4,371,057, Cl. 182-184.000.

Bloch, Christopher D.: *See*—
Goldberg, Jerome; and Bloch, Christopher D., 4,371,191, Cl. 280-707.000.

Bloom, Richard L., to United States of America, Navy. Chaff dipole elements and method of packaging. 4,371,874, Cl. 343-18.00B.

Bocassi, Joseph V.: *See*—
Zarrelli, Neal; Bocassi, Joseph V.; and Miller, Robert S., 4,370,969, Cl. 123-525.000.

Bock, Gustav: *See*—
Scherer, Hans; Lotsch, Wolfgang; and Bock, Gustav, 4,371,735, Cl. 544-300.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Tamm, Rolf G. A., 4,371,262, Cl. 356-312.000.
Witte, Wolfgang W. F., 4,371,263, Cl. 356-333.000.

Boehme, George R.: *See*—
Karr, Lawrence J.; Wasserman, Gary L.; and Boehme, George R., 4,371,945, Cl. 364-561.000.

Boeing Company, The: *See*—
Hamilton, William H., 4,370,831, Cl. 49-477.000.

Boeke, Wouter M., to U.S. Philips Corporation. Differential load circuit equipped with field-effect transistors. 4,371,844, Cl. 330-253.000.

Boesten, Wilhelmus H. J.; and Schiepers, Lambertus A. C., to Stamicarbon, B.V. Dipeptide sweetener. 4,371,464, Cl. 260-112.50R.

Bogetti, Lorenzo: *See*—
Tornatore, Giovanni; and Bogetti, Lorenzo, 4,371,828, Cl. 322-32.000.

Bohg, Armin; and Hartmann, Kurt, to International Business Machines Corporation. Electromagnetically operable ram actuator in particular for impact printers. 4,371,857, Cl. 335-259.000.

Bohman, Nils-Erik. T-Shaped sealing ring with elongated lip. 4,371,179, Cl. 277-207.00A.

Bolanos, Anthony R. Space heating stove with stress relieving walls. 4,370,973, Cl. 126-58.000.

Boles, Ralph A., to Sawyer, John. Connecting rod with variable length. 4,370,901, Cl. 74-586.000.

Borca, Bruno; and Ruscelli, Emilio, to Industrie Pirelli S.p.A. Fluid impermeable liner for a cavity in the earth. 4,371,288, Cl. 405-53.000.

Borg-Warner Corporation: *See*—
Kim, Tong S.; and Lee, Yong N., 4,370,868, Cl. 62-504.000.

Bork, Klaus; and Rueckerl, Alfred, to Siemens Aktiengesellschaft. Pivotable ink-repelling screen for the writing head of an ink recording device. 4,371,881, Cl. 346-140.00R.

Born, Raisa I.: *See*—
Alekhin, Stanislav A.; Bakhir, Vitold M.; Born, Raisa I.; and Bakhir, Tatyana M., 4,370,885, Cl. 73-153.000.

Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, to Siemens Aktiengesellschaft. Monitoring device for distinguishing the operating state of a load. 4,371,831, Cl. 323-284.000.

Boswell, Bennie J.: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,371,039, Cl. 172-244.000.

Bottemiller, Donald L.; and Miles, John K., to Homecrest Industries Incorporated. Rocking chair. 4,371,142, Cl. 248-573.000.

Bourland, Larry G., to Atlantic Richfield Company. Compatible blends of chlorinated polyvinyl chloride resins and styrene-maleic anhydride resins. 4,371,666, Cl. 525-207.000.

Bower, Thomas E.; and Aust, John J., to Owens-Illinois, Inc. Method for making a produce tray. 4,371,366, Cl. 493-138.000.

Boyer, Gerard A. M.; Duvdevani, Ilan; and Muller, Jean-Marie A., to Exxon Research and Engineering Co. Bitumen-containing extended compositions. 4,371,641, Cl. 524-70.000.

Bradshaw, Jack E. Delimbing apparatus. 4,371,016, Cl. 144-2.00Z.

Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, to A/S Ferrosan; and Scherling AG. β-Carbolin-3-carboxylic acid derivatives. 4,371,536, Cl. 424-256.000.

Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., to Black & Decker Inc. Pressure regulator and safety valve assembly. 4,370,997, Cl. 137-116.300.

Brancaleone, Salvatore T., to International Telephone and Telegraph Corporation. Filter connector and method of assembly thereof. 4,371,226, Cl. 339-147.00R.

Brander, James E., to International Combusion Australia Limited. Vibrating linear motor for electromagnetic feeders and similar machines. 4,371,800, Cl. 310-15.000.

Brandt, Warren J., to Jenkins, O. C. Anti-theft device for motor vehicles. 4,371,052, Cl. 180-287.000.

Brann, John J.; Freer, Charles S., Jr.; and Jensen, Warren W., to International Business Machines Corporation. Multiprocessor system with high density memory set architecture including partitionable cache store interface to shared disk drive memory. 4,371,929, Cl. 364-200.000.

Bredeweg, Roger L., to Leco Corporation. Sample loading mechanism. 4,371,971, Cl. 373-115.000.

Breitwisch, Ronald L.: *See*—
King, Dennis D.; Breitwisch, Ronald L.; and Nickum, James D., 4,371,981, Cl. 455-219.000.

Bremer, Wolfgang: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Brennan, Michael J., to Ex-Cell-O Corporation. Universal joint. 4,371,359, Cl. 464-136.000.

Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, to Texaco Inc. Swirl burner for partial oxidation process. 4,371,378, Cl. 48-86.00R.

Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, to Texaco Inc. Partial oxidation process using a swirl burner. 4,371,379, Cl. 48-197.00R.

Brent Chemicals International Limited: *See*—
Alexiou, Michael S.; Brittain, Philip I.; and Tyman, John H. P., 4,371,694, Cl. 546-100.000.

Bresenham, Jack E.; Grice, Donald G.; and Pi, Shing-Chou, to International Business Machines Corporation. Bi-directional display of circular arcs. 4,371,933, Cl. 364-300.000.

Bridgestone Tire Company Limited: *See*—
Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, 4,371,411, Cl. 156-281.000.

Briner, Emil; and Novak, Peter, to Rieter Machine Works, Ltd. Roving frame and a method of packaging roving. 4,370,850, Cl. 57-96.000.

Bringer, Jacques: *See*—
Grodsky, Gerold M.; and Bringer, Jacques, 4,371,523, Cl. 424-178.000.

Brister, Beryle D., to Brister Incorporated. Apparatus and method for freezing a slug of liquid in a section of a large diameter fluid transmission line. 4,370,862, Cl. 62-66.000.

Brister Incorporated: *See*—
Brister, Beryle D., 4,370,862, Cl. 62-66.000.

British-American Tobacco Company Limited: *See*—
Krywiczanin, Wladyslaw H.; and Lumsden, William, 4,371,418, Cl. 156-497.000.

British Gas Corporation: *See*—
Wright, David M., 4,370,895, Cl. 74-216.000.

British Industrial Plastics Limited: *See*—
Ogden, Dennis H., 4,371,486, Cl. 264-46.600.

Brittain, Philip I.: *See*—
Alexiou, Michael S.; Brittain, Philip I.; and Tyman, John H. P., 4,371,694, Cl. 546-100.000.

Broadt, David R.; and Audesse, Emery G., to GTE Products Corporation. Reflector lamp module for photoflash array. 4,371,913, Cl. 362-17.000.

Broadt, David R.; Armstrong, Donald E.; and Kackenmeister, Carl F., to GTE Products Corporation. Photoflash unit with circuit board radiation switches for selective pairing of lamps. 4,371,914, Cl. 362-15.000.

Broadt, David R.; and Kackenmeister, Carl F., to GTE Products Corporation. Photoflash unit with reflector recesses for circuit board switches. 4,371,915, Cl. 362-15.000.

Brodsky, Viktor M.: *See*—
Kopytsky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Brolin, Stephen J., to Bell Telephone Laboratories, Incorporated. Bridge lifter circuit. 4,371,755, Cl. 179-35.000.

Bronicki, Lucien Y.: *See*—
Assaf, Gad, 4,370,859, Cl. 60-641.600.

Brooke, Raymond, to Pertec Computer Corporation. Flexible magnetic disk system. 4,371,904, Cl. 360-77.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirose, Noboru, 4,371,297, Cl. 408-130.000.

Brouwer, Frans. Optical pattern tracing system with remotely controlled kerf and forward offsets. 4,371,782, Cl. 250-202.000.

Brouwer Turf Equipment Limited: *See*—
Arnold, William T., 4,370,846, Cl. 56-6.000.

Brown, Derek. Fuel rate control for internal combustion engines. 4,370,961, Cl. 123-352.000.

Brown, J. Martin: *See*—
Lee, William W.; Brown, J. Martin; Martinez, Abelardo P.; and Cory, Michael J., 4,371,540, Cl. 424-273.00R.

Brown, Peter W., to Lucas Industries Limited. Vehicle suspension system. 4,371,182, Cl. 280-6.00H.

Brown, Richard P.: *See*—
Barlow, George J.; Stanley, Philip E.; and Brown, Richard P., 4,371,928, Cl. 364-200.000.

Brown Stove Works, Inc.: *See*—
Runion, Cleaston L., 4,371,764, Cl. 200-61.860.

Brownlee, Michael: *See*—
Cerami, Anthony; Brownlee, Michael; and Vlassara, Helen, 4,371,374, Cl. 23-230.00B.

Brucher, Egon. Self-lubricating plain bearing. 4,371,220, Cl. 384-371.000.

Brunswick Corporation: *See*—
Gifford, Richard L.; and Councilman, Richard R., 4,371,124, Cl. 242-84.51A.

Bube, Carsten; Dull, Ernst H.; Thiele, Gerd; and Zeller, Hans, to Robert Bosch GmbH. Safety device for electric consumers in motor vehicles. 4,371,910, Cl. 361-106.000.

Bucklers, Lothar: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,371,547, Cl. 424-333.000.

Budd Company, The: *See*—
Reidenbach, Robert B., 4,370,795, Cl. 29-559.000.

Budich, Wolfgang: *See*—
Schaefer, Hans; and Budich, Wolfgang, 4,370,830, Cl. 49-413.000.

Bulova Watch Co., Inc.: *See*—
Sutter, Hans-Rudolf, 4,371,269, Cl. 368-205.000.

Bunyard, Alan D. Piston-rack rotary actuator. 4,370,917, Cl. 91-491.000.

Burgbacher, Martin; Harmsen, Siegfried; and Papst, Georg, to Papst-Motoren K.G. Miniature diagonal blower with axial flow inlet and radial flow outlet. 4,371,313, Cl. 415-215.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,371,966, Cl. 372-45.000.

Burniski, Edward W. Automatic self-leveling instrument mount. 4,370,813, Cl. 33-291.000.

Burns, John M.: *See*—
Baise, Arnold I.; Burns, John M.; and Sachdev, Harbans S., 4,371,565, Cl. 427-41.000.

Burroughs Corporation: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,371,931, Cl. 364-200.000.
Chadra, David P., 4,371,948, Cl. 364-900.000.
Chadra, David P., 4,371,950, Cl. 364-900.000.
Chu, Ke-Chiang; and Sharp, Richard S., 4,371,949, Cl. 364-900.000.
Kim, Dongsung R., 4,371,930, Cl. 364-200.000.

Bush, Elmer W. Apparatus for removing contaminants from crankcase emissions. 4,370,971, Cl. 123-573.000.

Bush, Harry D.: *See*—
Medernach, John W.; Novak, Ivan A.; and Bush, Harry D., 4,371,598, Cl. 430-22.000.

Bush, Herbert A., Jr.: *See*—
Oxenreider, Terry R.; and Bush, Herbert A., Jr., 4,371,591, Cl. 429-88.000.

Butler, John D., to Artos Engineering Company. Wire lead forming machine. 4,370,786, Cl. 29-33.00M.

Buttner, Horace J. Heat transfer system. 4,371,032, Cl. 165-91.000.

Dyleveld, Eduard, to Himsley Engineering Limited. Ammoniacal elation of copper from ion exchange resins. 4,371,506, Cl. 423-24.000.
Cain, Darryl F.; and Ehrecke, Kevin L., to Deere & Company. Trailer frame. 4,371,299, Cl. 410-44.000.
Cairns, John F., to Imperial Chemical Industries Limited. Production of porous diaphragm for electrolytic cell. 4,371,564, Cl. 427-35.000.
Calundann, Gordon W.; and East, Anthony J., to Celanese Corporation. Anisotropic melt phase forming poly(ester-carbonate) derived from 6-hydroxy-2-napthoic acid, aromatic diol, organic compound capable of forming a carbonate linkage, and, optionally, other aromatic hydroxy-acid and carbocyclic dicarboxylic acid. 4,371,660, Cl. 524-601.000.
Camp, Carey A., to Western Electric Company, Inc. Methods of straightening backplane-supported pins. 4,371,013, Cl. 140-147.000.
Campagna, Thomas G., to Aqualume, Incorporated. Tubeless tire with insert for preventing collapse in the event of loss of air pressure. 4,371,023, Cl. 152-158.000.
Campbell, Willis R.; Freimuth, John H.; Diederich, Anthony F., Jr.; and Jennings, Richard E., to Sperry Corporation. Baling machine with tapered bale chamber. 4,370,848, Cl. 56-341.000.
Camras, Marvin, to IIT Research Institute. Video disc transducer system and method. 4,371,894, Cl. 358-342.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Sandoz, Oscar A.; and Mar, John, 4,371,957, Cl. 367-3.000.
Cane, Alessandro, to Zanasi Nigris S.p.A. Apparatus for dosing and dispensing a predetermined volume of powdered material. 4,371,014, Cl. 141-91.000.
Cane, Alessandro; and Farneti, Arrigo, to Zanasi Nigris S.p.A. Filtering screen for use in apparatus for the dosing of powdered material. 4,371,101, Cl. 222-636.000.
Canevari, Cesare; and Signorini, Aldo, to Societa' Pneumatici Pirelli S.p.A. Reinforcing annular structure of radial tires. 4,371,025, Cl. 152-352.00R.
Canon Kabushiki Kaisha: *See—*
Fujikawa, Kenji, 4,371,241, Cl. 352-140.000.
Ohara, Tsunemasa; and Yamamichi, Masayoshi, 4,371,594, Cl. 429-97.000.
Shimizu, Ichiro; Komine, Yoshio; and Masunaga, Makoto, 4,371,240, Cl. 352-140.000.
Suwa, Kaname, 4,371,595, Cl. 429-98.000.
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.
Tsuji, Sadahiko, 4,371,261, Cl. 356-1.000.
Yoshimura, Shigeru; and Shimizu, Katsuichi, 4,371,256, Cl. 355-14.0SH.
Cante, Charles J.: *See—*
Friedman, Herman H.; Giacone, Joseph; Cante, Charles J.; and Frost, John R., 4,371,562, Cl. 426-656.000.
Capri-Codec SA: *See—*
de Vienne, Robert, 4,371,172, Cl. 277-12.000.
Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., to Data General Corporation. Data processing system having unique bus control operation. 4,371,925, Cl. 364-200.000.
Carduck, Franz-Josef: *See—*
Christophliemk, Peter; Wust, Willi; and Carduck, Franz-Josef, 4,371,510, Cl. 423-329.000.
Caribbean Properties Limited: *See—*
Rose, Leon I., 4,371,382, Cl. 55-92.000.
Carl Freudenberg, Firma: *See—*
Bahr, Gunter; Habel, Erich; and Hafner, Werner, 4,371,177, Cl. 277-152.000.
Carlo, Louis D., to American Industries, Inc. Dual mode shifter for automatic transmissions. 4,370,897, Cl. 74-475.000.
Carpenter Technology Corporation: *See—*
Henthorne, Michael; Yinger, Robert J.; and DeBold, Terry A., 4,371,394, Cl. 75-128.00A.
Carpenter, William T., Jr. Well tool for detecting well bore deviation in drill string. 4,370,814, Cl. 33-307.000.
Carr, Peter: *See—*
Chi, Michael C.; and Carr, Peter, 4,371,825, Cl. 320-5.000.
Carreras Fontcuberta, Francisco, to Bassetti S.p.A. Method and mechanism for inserting an elastic band in selected areas of mattress-wrapping bedclothes. 4,370,939, Cl. 112-262.200.
Carrieri, Louis F., to Gulf & Western Manufacturing Company. Workpiece ejector system for presses. 4,370,878, Cl. 72-345.000.
Carter, Max E., Sr.: *See—*
Jenkins, John M., III; Carter, Max E., Sr.; Green, Michael L.; and Cavender, Marvin E., 4,371,977, Cl. 378-51.000.
Cartier International B.V.: *See—*
Saujet, Claude, 4,371,087, Cl. 215-12.00R.
Cartmell, James V., to NDM Corporation. X-Ray transparent medical electrode. 4,370,984, Cl. 128-640.000.
Cartwright, Richard V.; and Lees, Ronald D., to Hercules Incorporated. Gelatinized high explosive composition and method of preparation. 4,371,409, Cl. 149-94.000.
Case, Edward M.; and Hopper, Chester S., to Marlo Company Incorporated, The. Gasket material. 4,371,180, Cl. 277-230.000.
Case, Manson D., to Sonoco Products Company. Yarn tube with universal pickup groove. 4,371,130, Cl. 242-125.100.
Caspar, John A.: *See—*
Schimdel, Arnold; and Caspar, John A., 4,371,803, Cl. 310-242.000.
Cassel, David E.: *See—*
Henry, John W., IV; and Cassel, David E., 4,371,310, Cl. 415-211.000.
Caterpillar Tractor Co.: *See—*
Kaveney, John R., Jr., 4,371,205, Cl. 292-48.000.
Pickering, William; and Urbanc, David J., 4,370,891, Cl. 73-861.030.
Stevens, Samuel B., 4,371,410, Cl. 156-117.000.
Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Linear micro-sequencer for micro-processor system utilizing specialized instruction format. 4,371,931, Cl. 364-200.000.
Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Process for enzymatically producing L-carnitine. 4,371,618, Cl. 435-128.000.
Cavender, Marvin E.: *See—*
Jenkins, John M., III; Carter, Max E., Sr.; Green, Michael L.; and Cavender, Marvin E., 4,371,977, Cl. 378-51.000.
Cebulla, Dietrich: *See—*
Sedlacek, Franz; Oertle, Jakob; and Cebulla, Dietrich, 4,371,115, Cl. 239-524.000.
Celanese Corporation: *See—*
Calundann, Gordon W.; and East, Anthony J., 4,371,660, Cl. 524-601.000.
Turnbull, John, 4,370,784, Cl. 28-166.000.
Centrum Konstrukcyjno-Technologiczne Maszyn Gorniczych "Komag": *See—*
Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, 4,371,477, Cl. 261-30.000.
Cerami, Anthony; Brownlee, Michael; and Vlassara, Helen, to Rockefeller University, The. Monitoring metabolic control in diabetic patients by measuring glycosylated amino acids and peptides in urine. 4,371,374, Cl. 23-230.00B.
Ceshkovsky, Ludwig; and Dakin, Wayne R., to Discovision Associates. Time base error correction system for player. 4,371,899, Cl. 358-315.000.
Chabrier, Gilbert, to Spie-Batignolles. Pipeline for conveying hot or cold fluids. 4,371,197, Cl. 285-47.000.
Chadra, David P., to Burroughs Corporation. Train printer-data link processor. 4,371,948, Cl. 364-900.000.
Chadra, David P., to Burroughs Corporation. Peripheral control interface circuit for train printer-data link processor. 4,371,950, Cl. 364-900.000.
Chalmers, Walter M. Electric connector. 4,371,228, Cl. 339-221.00R.
Chamard, Alex; Dougier, Patrick; and Monteil, Jean-Bruno, to Rhone-Poulenc Industries. High coercivity, cobalt-doped ferrimagnetic iron oxide particulates. 4,371,567, Cl. 427-130.000.
Champion International Corporation: *See—*
Korte, Ralph J., 4,371,104, Cl. 225-48.000.
Champion Spark Plug Europe, S.A.: *See—*
van den Berg, Johan H.; and Le Sausse, Robert T., 4,370,775, Cl. 15-250.320.
Chan, Keng S.: *See—*
Webb, Thomas H.; Vest, Hugh F.; and Chan, Keng S., 4,371,447, Cl. 252-73.000.
Chang, Chin-An: *See—*
Esaki, Leo; and Chang, Chin-An, 4,371,884, Cl. 357-12.000.
Chang, David C., to Du Pont de Nemours, E. I., and Company. Crater resistant acrylic enamel. 4,371,657, Cl. 524-512.000.
Chang, Jaw-Kang: *See—*
Pert, Candace B.; and Chang, Jaw-Kang, 4,371,463, Cl. 260-112.50E.
Chapman, Robert M. Method of and stand for disassembling structures such as radiators. 4,371,106, Cl. 228-19.000.
Charles Beseler Company: *See—*
Howitt, George L., 4,371,259, Cl. 355-38.000.
Chauvin, Yves; Commereuc, Dominique; and Sugier, Andre, to Institut Francais du Petrole. Process for the catalytic synthesis of methane by reacting hydrogen with carbon monoxide. 4,371,627, Cl. 518-700.000.
Chemokomplex Vegyipari Gepes Berendezes Export Import Vallalat: *See—*
Weiperth, Vilmos; and Lezsak, Tibor, 4,371,114, Cl. 239-309.000.
Chemopetrol, koncernovy podnik, Chemicke zavody ceskoslovenskosovetskeho pratelstvi: *See—*
Kadlec, Vlastimil; Grosser, Vojtech; and Rosenthal, Jakub, 4,371,456, Cl. 252-435.000.
Chen, I-Heng; and Liss, Warren A., to Bell Telephone Laboratories, Incorporated. Power control arrangement. 4,371,789, Cl. 307-38.000.
Cheng, Paul J., to Phillips Petroleum Company. Decreasing carbon black reactor fouling rate. 4,371,511, Cl. 423-456.000.
Cheron, Christian: *See—*
Queveau, Gerard; and Cheron, Christian, 4,371,186, Cl. 280-432.000.
Cherry Electrical Products Corporation: *See—*
Clark, John T., Jr., 4,371,759, Cl. 200-5.00R.
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., to Nabisco Brands, Inc. Stable liquid red beet color and chewing gum containing same. 4,371,549, Cl. 426-3.000.
Chi, Michael C.; and Carr, Peter, to Energy Development Associates, Inc. Method of minimizing the effects of parasitic currents. 4,371,825, Cl. 320-5.000.
Chicklis, Evan P.; and Mosto, James R., to Sanders Associates, Inc. Low cost laser. 4,371,969, Cl. 372-77.000.
Chiddix, Max E., to GAF Corporation. Process of producing a distilled butanediol product of high quality in high yield. 4,371,723, Cl. 568-861.000.

Child, Edward T.: *See—*
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.

CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.

Chiu, Te-Long: *See—*
Lien, Jih-Chang; and Chiu, Te-Long, 4,370,798, Cl. 29-576.00B.

Choudhury, Hrishikesh; and Zaha, Juergen H., to Abbott Laboratories. Washing apparatus for small parts. 4,370,992, Cl. 134-100.000.

Christensen, Joergen A.: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

Christgau, Hermann: *See—*
Bintig, Werner; and Christgau, Hermann, 4,371,806, Cl. 313-101.000.

Christopher, Donald S.: *See—*
Stock, Arthur J.; and Christopher, Donald S., 4,371,201, Cl. 292-251.000.

Christophliemk, Peter; Wust, Willi; and Carduck, Franz-Josef, to Henkel Kommanditgesellschaft Auf Aktien; and Degussa Aktiengesellschaft (Henkel KGaA). Process for the continuous crystallization of zeolitic sodium aluminosilicates of smallest particle size. 4,371,510, Cl. 423-329.000.

Chromalloy American Corporation: *See—*
Schaaf, Wayne J.; and Boswell, Bennie J., 4,371,039, Cl. 172-244.000.

Chu, Albert E., to E-Y Laboratories, Inc. Method for forming an isolated lectin-immunological conjugate. 4,371,515, Cl. 436-544.000.

Chu, Chin-Chiun, to Mobil Oil Corporation. Zeolites modified with group VA metals. 4,371,457, Cl. 252-437.000.

Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory accessing system having automatically updatable error logging means. 4,371,949, Cl. 364-900.000.

Chupp, John P.: *See—*
Alt, Gerhard H.; and Chupp, John P., 4,371,717, Cl. 568-681.000.

Churchland, Mark T.: *See—*
Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., 4,371,020, Cl. 144-366.000.

Chus, Vladimir G.: *See—*
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Ciba-Geigy Corporation: *See—*
Topfl, Rosemarie, 4,371,637, Cl. 523-416.000.
Zahir, Abdul-Cader; and Wyler, Siegfried, 4,371,719, Cl. 568-723.000.

Ciccarelli, Roger N., to Xerox Corporation. Positively charged developer compositions containing telomeric amines. 4,371,601, Cl. 430-110.000.

Cicognani, Mario; Tangorra, Giorgio; and Cimatti, Gianfranco, to Industrie Pirelli S.p.A. Toothed belt. 4,371,363, Cl. 474-205.000.

Cimatti, Gianfranco: *See—*
Cicognani, Mario; Tangorra, Giorgio; and Cimatti, Gianfranco, 4,371,363, Cl. 474-205.000.

Ciments Lafarge France: *See—*
Grapin, Jean P.; Gauthier, Gilbert; and Deltruc, Francis, 4,371,120, Cl. 241-284.000.

Cincinnati, Milacron Inc.: *See—*
Damikolas, Gerasimos, 4,371,942, Cl. 364-475.000.

Citarella, William P.: *See—*
Pitchon, Ezra; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., 4,371,556, Cl. 426-311.000.

Citizen Watch Company Limited: *See—*
Enomoto, Tadao; and Kasai, Hidefumi, 4,371,429, Cl. 204-4.000.

Citterio, Camillo. Composite modular element structure for furnishings. 4,371,221, Cl. 312-199.000.

Clark, John T., Jr., to Cherry Electrical Products Corporation. Encoding switch. 4,371,759, Cl. 200-5.00R.

Clark, Peter D., to Sunsearch, Inc. Adjustable mounting rack for solar collectors. 4,371,139, Cl. 248-237.000.

Clarke, Eugene L., to Petrolite Corporation. Degasser-dehydrator. 4,371,434, Cl. 204-302.000.

Clarke, John A.: *See—*
Gammon, Michael W.; and Clarke, John A., 4,371,151, Cl. 266-186.000.

Claussen, Robert L.: *See—*
Silverman, Gary S.; Zera, Robert D.; Kubiatowicz, James F.; and Claussen, Robert L., 4,371,171, Cl. 273-357.000.

Clay, Roger D., to Phillips Petroleum Company. Product loading arm storage keeper. 4,371,136, Cl. 248-49.000.

Claycomb, Jack R. Drilling orientation tool. 4,371,958, Cl. 367-85.000.

Clem, Katherine V., to Eastman Kodak Company. Conductive elements for photovoltaic cells. 4,371,740, Cl. 136-256.000.

Clesid S.A.: *See—*
Guilpain, Bernard; and Tinchant, Xavier, 4,371,970, Cl. 373-74.000.

Coal Industry (Patents) Limited: *See—*
Alford, Derek; and Wilkinson, Alan, 4,371,209, Cl. 299-1.000.
Gavin, Derek G., 4,371,727, Cl. 585-14.000.

Cobe Laboratories, Inc.: *See—*
Johnson, Steven H., 4,371,385, Cl. 55-190.000.

Coetsier, Paul; and Ravarotto, Robert, to Etablissements M. Muller & Cie. Method of measuring the power output of an automative vehicle engine on a roller testing bench. 4,370,883, Cl. 73-117.000.

Cohen, Howard G.: *See—*
Herzig, Ralph B.; and Cohen, Howard G., 4,370,769, Cl. 5-452.000.

Cohn, Seymour B.; Karp, Arthur; and Stone, David S., to Varian Associates, Inc. Broadband high-power microwave window assembly. 4,371,854, Cl. 333-252.000.

Collington, Eric W.; Hallet, Peter; Wallis, Christopher J.; and Hayes, Norman F., to Glaxo Group Limited. Aminocyclopentanone amides and pharmaceutical formulation. 4,371,530, Cl. 424-244.000.

Colpo Company, Ltd.: *See—*
Imaizumi, Hiroo, 4,371,340, Cl. 433-74.000.

Columbus Show Case Company, The: *See—*
Vermillion, Eugene F., 4,370,838, Cl. 52-36.000.

Combes, Marvin G., to Grove Valve and Regulator Company. Orifice meter with replacable orifice disc. 4,370,893, Cl. 73-861.610.

Combustion Engineering, Inc.: *See—*
Bisbee, Charles B.; and Yost, Richard J., 4,370,840, Cl. 52-410.000.

Commercial Resins Company: *See—*
Hart, Robert J., 4,371,295, Cl. 406-128.000.

Commereuc, Dominique: *See—*
Chauvin, Yves; Commereuc, Dominique; and Sugier, Andre, 4,371,627, Cl. 518-700.000.

Commonwealth of Puerto Rico: *See—*
Acevedo, Francisco, 4,371,170, Cl. 273-271.000.
Fraser, Alberto, 4,370,767, Cl. 5-417.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Badet, Bernard; and Kurzweil, Karel, 4,371,744, Cl. 174-68.500.

Compton, A. Berkeley. Imaginary multi-level ticktacktoe. 4,371,169, Cl. 273-271.000.

Computer & Communications Technology Corporation: *See—*
Valstyn, Erich P.; and Kelley, G. Vinson, 4,371,905, Cl. 360-112.000.

Conoco, Inc.: *See—*
Mack, Mark P.; and Berge, Charles T., 4,371,455, Cl. 252-429.00C.

Consiglio Nazionale Delle Ricerche: *See—*
Assenza, Donello; and Pappalardo, Massimo, 4,370,785, Cl. 29-25.350.

Constantinides, Nicholas J.; and Bicknell, Thomas J., to United States of America, National Aeronautics and Space Administration. Servomechanism for doppler shift compensation in optical correlator for synthetic aperture radar. 4,371,946, Cl. 364-822.000.

Container Corporation of America: *See—*
Tanner, Donald M.; and Potts, Herbert M., 4,371,109, Cl. 229-28.00R.

Contour Fabricators, Inc.: *See—*
Wanchik, Joseph; and Gabriele, Joseph M., 4,370,976, Cl. 128-77.000.

Control Data Corporation: *See—*
Kort, Raymond C.; and Kelley, James W., 4,371,951, Cl. 364-900.000.

Controlled Environment Systems, Inc.: *See—*
Widmayer, Don F., 4,371,812, Cl. 315-291.000.

Converse, Gregg A.; and Converse, Maurice. Box top opener. 4,371,021, Cl. 145-21.000.

Converse, Maurice: *See—*
Converse, Gregg A.; and Converse, Maurice, 4,371,021, Cl. 145-21.000.

Copeland, Louis E.: *See—*
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,371,291, Cl. 405-169.000.

Cornelius Cannon, Inc.: *See—*
Fredrickson, Howard J., 4,371,085, Cl. 211-149.000.

Cornet, Jean, to Thomson-CSF. Reversible memory structure with thermo-optical writing and optical reading and process for writing and erasing said structure. 4,371,954, Cl. 365-126.000.

Coronet-Metallwarenfabrik GmbH: *See—*
Sturm, Bernd, 4,371,282, Cl. 403-277.000.

Corth, Richard, to Westinghouse Electric Corp. Plant growth type fluorescent lamp. 4,371,810, Cl. 313-487.000.

Cory, Michael J.: *See—*
Lee, William W.; Brown, J. Martin; Martinez, Abelardo P.; and Cory, Michael J., 4,371,540, Cl. 424-273.00R.

Costakis, Evan E.: *See—*
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,371,538, Cl. 424-267.000.

Coulter, Howard W.: *See—*
Triggs, Dennis R.; and Coulter, Howard W., 4,370,811, Cl. 33-32.00R.

Councilman, Richard R.: *See—*
Gifford, Richard L.; and Councilman, Richard R., 4,371,124, Cl. 242-84.51A.

Courtois, Christian: *See—*
Doussot, Michel; and Courtois, Christian, 4,371,877, Cl. 343-770.000.

Couturier, Alain: *See—*
Paris, Philippe Y. J.; and Couturier, Alain, 4,371,343, Cl. 434-29.000.

Cowan, Dwaine O.: *See*—
Potember, Richard S.; Poehler, Theodore O., Jr.; and Cowan, Dwaine O., 4,371,883, Cl. 357-8.000.
CRC Wireline, Inc.: *See*—
Willig, Roy L.; LeBlanc, Edward J., III; and Airhart, Harold, Sr., 4,371,044, Cl. 175-4.600.
Cremer, Heinz P.: *See*—
Engels, Bernd; Heise, Friedrich; and Cremer, Heinz P., 4,371,065, Cl. 192-8.00C.
Crick, David W.: *See*—
Jackman, Peter R.; and Crick, David W., 4,371,763, Cl. 200-61.45R.
Crinos Industria Farmabiologica S.p.A.: *See*—
Gazzani, Giovanni, 4,371,518, Cl. 424-78.000.
Cronenberger, Michel: *See*—
Benattar, Robert; and Cronenberger, Michel, 4,371,438, Cl. 210-232.000.
Cross Manufacturing Company Limited: *See*—
Baker, Archibald J. S., 4,370,788, Cl. 29-156.4WL.
Crouch, William B.: *See*—
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.
Crumby, John T. Combination poncho and cushion. 4,370,755, Cl. 2-88.000.
Cryoplants Limited: *See*—
Schuftan, Paul M., deceased, 4,371,381, Cl. 55-27.000.
CTS Corporation: *See*—
Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., 4,371,078, Cl. 206-329.000.
Cuisinarts, Inc.: *See*—
Sontheimer, Carl G.; and Podell, Allen F., 4,371,118, Cl. 241-30.000.
Cuneo, Giuseppe: *See*—
Alessio, Lorenzo E.; and Cuneo, Giuseppe, 4,371,906, Cl. 361-51.000.
Cushman, Glenn F., to Northrop Corporation. Inertial instrument with a temporally digitized rebalance network. 4,371,921, Cl. 364-138.000.
Custom Concepts Incorporated: *See*—
Silverman, Gary S.; Zera, Robert D.; Kubiatowicz, James F.; and Claussen, Robert L., 4,371,171, Cl. 273-357.000.
Czumak, Frank M.; and Fichter, Peter K., to Polaroid Corporation. Film processing kit. 4,371,249, Cl. 354-304.000.
Dage, Richard C.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,371,737, Cl. 544-370.000.
Dages, Daniel, to Saint-Gobain Vitrage. Plasticizers for polyvinyl butyral. 4,371,586, Cl. 428-437.000.
Dahlberg, Johan A. F.: *See*—
Astero , Ulf J. E.; Dahlberg, Johan A. F.; and Aberg, Kjell U., 4,371,155, Cl. 270-53.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Mitsuhashi, Yuji, 4,371,265, Cl. 356-432.000.
Daido Tokishuko Kabushiki Kaisha: *See*—
Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, 4,371,392, Cl. 75-10.00R.
Daiichi Radioisotope Laboratories, Ltd.: *See*—
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.
Daimler-Benz A.G.: *See*—
Andres, Rudolf; and Grantz, Helmut, 4,371,125, Cl. 242-107.000.
Grossner, Horst; Kaminski, Detlef; and Schwerdt, Paul, 4,370,965, Cl. 123-426.000.
Tank, Eggert, 4,371,312, Cl. 415-200.000.
Dainippon Ink and Chemicals Inc.: *See*—
Ando, Hirohito; and Furukawa, Naoki, 4,371,467, Cl. 260-165.000.
Dainippon Screen Manufacturing Co., Ltd.: *See*—
Wakabayashi, Masayoshi; and Taniguchi, Matsuyoshi, 4,371,250, Cl. 354-325.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Yoshimoto, Takeshi; Hiraoka, Hideki; Okazaki, Seiji; Taniguchi, Yoshihiro; and Harada, Tsutomu, 4,371,260, Cl. 355-77.000.
Daitoku, Koichi; Sekine, Kenji; Matsukawa, Nobuo; and Sugimori, Shiro, to Nippon Kogaku K.K. Apparatus for controlling film advancement in a camera. 4,371,244, Cl. 354-173.000.
Dakin, Wayne R.: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., 4,371,899, Cl. 358-315.000.
D'Amico, John J., to Monsanto Company. 3-Substituted aminoalkyl-2-benzothiazolinones as plant growth regulants. 4,371,388, Cl. 71-90.000.
Damikolas, Gerasimos, to Cincinnati, Milacron Inc. Method and apparatus for controlling an automatic set-up cycle of operation. 4,371,942, Cl. 364-475.000.
Dammann, Peter: *See*—
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,370,853, Cl. 57-340.000.
Danguillier, Wilhelm; Grams, Wolfgang; and Tietze, Jurgen, to Dr. C. Otto & Comp. G.m.b.H. Shaft-like dry cooler for coke. 4,371,425, Cl. 202-228.000.
Dardoufas, Kimon C.: *See*—
Marshall, Robert M.; and Dardoufas, Kimon C., 4,371,658, Cl. 524-585.000.
D'Artois, Christian: *See*—
Desaleux, Jean; and D'Artois, Christian, 4,370,993, Cl. 135-19.500.
Das, Amitabha, to Ionomet Company. Resist system having increased light response. 4,371,608, Cl. 430-315.000.
Data General Corporation: *See*—
Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., 4,371,925, Cl. 364-200.000.
Dauel, Darold R.; Kiesling, Clarence R.; and May, Jerry L., to Henderson & Sturm. Air jet helicopter rotor hub and air distribution system. 4,371,314, Cl. 416-20.00A.
Davidson, James D. Shutter shields (R), auto-mated thermal shutters for glass areas. 4,370,826, Cl. 49-63.000.
Davidson, Roderick I., to Fibun B.V. Fence or wall incorporating fibre-optic wave-guide. 4,371,869, Cl. 340-557.000.
Davis, Anthony D.: *See*—
Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., 4,371,038, Cl. 166-380.000.
Davis, Jefferson W., Jr., to United States of America, Energy. Synthesis of alpha-amino acids. 4,371,705, Cl. 562-444.000.
Davis, Wendell: *See*—
Frias, Robert; Minnis, C. W.; Hawkins, A. Hubert; and Davis, Wendell, 4,371,302, Cl. 414-22.000.
Day, Pierce B.; and Marsiglio, Carl M., to Eastman Kodak Company. Color electrophotographic copier. 4,371,253, Cl. 355-4.000.
Dayton-Walther Corporation: *See*—
Walther, William D., 4,371,213, Cl. 301-12.00R.
DCA Food Industries: *See*—
Hochhauser, Arthur; and Jackson, Richard B., 4,371,560, Cl. 426-643.000.
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, to Rockwell International Corporation. Automatic fault recovery system for a multiple processor telecommunications switching control. 4,371,754, Cl. 179-18.0EE.
DeAlto, Michael E.; DiGiacomo, Joseph D.; Marritt, Clifford R.; and Preston, Edward G., to Molins Limited. Cutting head for filter assembler. 4,370,908, Cl. 83-348.000.
DeBold, Terry A.: *See*—
Henthorne, Michael; Yinger, Robert J.; and DeBold, Terry A., 4,371,394, Cl. 75-128.00A.
Debortoli, George; Meyerstein, Michael V.; and Velsher, Benne, to Northern Telecom Limited. Enclosure for outdoor cross-connect system for telecommunications. 4,371,757, Cl. 179-98.000.
de Broqueville, Axel. Transportation system utilizing a stretchable train of cars and stretchable bandconveyors. 4,370,931, Cl. 104-20.000.
Decker, Earl L., to General Motors Corporation. Hinged pull-down fuse block assembly. 4,371,743. Cl. 174-52.00R.
Decker, Werner: *See*—
Achelpohl, Fritz; and Decker, Werner, 4,371,367, Cl. 493-256.000.
Decorzant, Rene: *See*—
Naf, Ferdinand; Decorzant, Rene; and Schulte-Elte, Karl H., 4,371,460, Cl. 252-522.00R.
Deere & Company: *See*—
Cain, Darryl F.; and Ehrecke, Kevin L., 4,371,299, Cl. 410-44.000.
Troemner, James O.; Wetrich, Peter D.; and Volz, William A., 4,371,063, Cl. 192-4.00A.
Degn, Kaj; and Waldstrom, Ejvind, to O. G. Hoyer A/S. Packaging apparatus. 4,370,844, Cl. 53-546.000.
Degussa Aktiengesellschaft: *See*—
Muller, Karl-Hans; and Barthel, Walter, 4,371,400, Cl. 106-273.00R.
Degussa Aktiengesellschaft (Henkel KGaA): *See*—
Christophliemk, Peter; Wust, Willi; and Carduck, Franz-Josef, 4,371,510, Cl. 423-329.000.
Delevallee, Bernard A.: *See*—
Bezard, Jean-Jacques; and Delevallee, Bernard A., 4,371,834, Cl. 324-167.000.
Deltruc, Francis: *See*—
Grapin, Jean P.; Gauthier, Gilbert; and Deltruc, Francis, 4,371,120, Cl. 241-284.000.
De Martino, Ennio, to IAO Industrie Riunite S.p.A. Motor-vehicle lamp with base area illumination. 4,371,916, Cl. 362-31.000.
Dembicks, Andrew E., to Southern Case, Inc. Container for chain saws. 4,371,079, Cl. 206-349.000.
Dennis, Silas P., Jr.; and Dennis, Tony M. Apparatus and process for drying sawdust. 4,371,375, Cl. 44-2.000.
Dennis, Tony M.: *See*—
Dennis, Silas P., Jr.; and Dennis, Tony M., 4,371,375, Cl. 44-2.000.
Denny, Jon P. M. Tufting machines. 4,370,937, Cl. 112-79.00A.
Denzin, Horst, to Francotyp GmbH. Subassembly combination for mail processing machines. 4,371,416, Cl. 156-441.500.
Depery, Jean: *See*—
Laesser, Claude; Zafferri, Roberto; and Depery, Jean, 4,371,821, Cl. 318-696.000.
Desaleux, Jean; and D'Artois, Christian, to Desaleux, Jean. Disposable umbrella. 4,370,993, Cl. 135-19.500.
Des Lierres, John M.: *See*—
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,371,291, Cl. 405-169.000.
DeSoto, Inc.: *See*—
Mylonakis, Stamatios G.; and Tortorello, Anthony J., 4,371,669, Cl. 526-311.000.
de Soyres, Bruno; and Nouvel, Jacques, to Rhone-Poulenc Industries. Hydrocarbon stock solutions of $Cr^{+}6$ compounds storage-stabilized by a soluble partial ester of a phosphoric acid. 4,371,471, Cl. 260-438.50R.

DeTar, George F., Jr.: *See*—
Schaefer, Marcus J.; and DeTar, George F., Jr., 4,371,924, Cl. 364-200.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Lindner, Friedrich; and Scheunemann, Kurt, 4,371,029, Cl. 165-10.000.
DeVecchi, Francisco, to Veco International, Inc. Filter housing. 4,371,386, Cl. 55-338.000.
de Vienne, Robert, to Capri-Codec SA. Anchoring and sealing coupling for a cable. 4,371,172, Cl. 277-12.000.
Deville, Christian; and Lafuma, Philippe, to Thomson-CSF. Variable pitch delay line for travelling-wave tube and travelling-wave tube equipped with such a line. 4,371,852, Cl. 333-157.000.
De Wolf, Frank T.; and Kimberlin, Dan W., to General Electric Company. Permanent magnet field pole for a direct current dynamoelectric machine. 4,371,799, Cl. 310-154.000.
Diamond International Corporation: *See*—
O'Neill, Richard K., 4,371,097, Cl. 222-321.000.
Diamond, John A., to Vapor Corporation. Contactless pressure sensitive switch. 4,371,762, Cl. 200-61.430.
Di Battista, Piero; and Gratani, Francesco, to Montedison S.p.A. Stabilizers for polymers and polymers stabilized thereby. 4,371,695, Cl. 546-190.000.
DiBiano, Robert J.; and Hobbs, James W., to Phillips Petroleum Company. Control of a fractional distillation process. 4,371,426, Cl. 203-2.000.
Dick, Perry J., Jr., to Norwood Minerals, Inc. Consolidation of slurries of solid particulate materials. 4,371,376, Cl. 44-10.00R.
Diederich, Anthony F., Jr.: *See*—
Campbell, Willis R.; Freimuth, John H.; Diederich, Anthony F., Jr.; and Jennings, Richard E., 4,370,848, Cl. 56-341.000.
Diepers, Heinrich; and Sachs, Bertram, to Siemens Aktiengesellschaft. Ultrasonic transducer arrangement and method for fabricating same. 4,371,805, Cl. 310-334.000.
Dietrich, Karl-Heinz; Gruber, Josef; Rauffer, Walter; and Nassl, Peter, to Agfa-Gevaert AG. Objective lens exchanging arrangement in a microfilm reader. 4,371,242, Cl. 353-101.000.
DiGiacomo, Joseph D.: *See*—
DeAlto, Michael E.; DiGiacomo, Joseph D.; Marritt, Clifford R.; and Preston, Edward G., 4,370,908, Cl. 83-348.000.
Dijkmans, Eise C.; and Immink, Kornelis A., to U.S. Philips Corporation. Device for artificial reverberation. 4,371,748, Cl. 179-1.000.
Dijkmans, Eise C.: *See*—
Van de Grift, Robert E. J.; Van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,371,868, Cl. 340-347.0CC.
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Jackson, Timothy; and Zipoy, William L., to International Business Machines Corp. I/O Controller for transferring data between a host processor and multiple I/O units. 4,371,932, Cl. 364-200.000.
Dion, Jean-Paul. Folding wheel-chair. 4,371,183, Cl. 280-42.000.
Discovision Associates: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., 4,371,899, Cl. 358-315.000.
Distler, Dieter; Wolf, Hans; and Welzel, Gerhard, to BASF Aktiengesellschaft. Preparation of copolymer dispersions having a narrow particle size distribution, and exhibiting dilatant flow over a broad range of concentrations. 4,371,636, Cl. 523-223.000.
DMA Systems Corporation: *See*—
Lewis, Martyn A., 4,371,903, Cl. 360-75.000.
Dmitriev, Viktor D.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
Dobkin, Robert C., to National Semiconductor Corporation. High gain composite transistor. 4,371,792, Cl. 307-255.000.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Danguillier, Wilhelm; Grams, Wolfgang; and Tietze, Jurgen, 4,371,425, Cl. 202-228.000.
Dodge, Carl: *See*—
Smith, Harry D., Jr.; and Dodge, Carl, 4,370,886, Cl. 73-153.000.
Dohmoto, Hidetaka: *See*—
Fujita, Teizo; Dohmoto, Hidetaka; and Toyoda, Shigeru, 4,371,922, Cl. 364-144.000.
Dohring, Edward F.: *See*—
Hewelt, Robert K.; and Dohring, Edward F., 4,371,247, Cl. 354-300.000.
Dolan, John E. Automatic dosing dispenser. 4,370,763, Cl. 4-228.000.
Dollheimer, Jurgen; and Knoll, Klaus, to Siemens Aktiengesellschaft. Circuit arrangement for moving a marker over the picture screen. 4,371,813, Cl. 315-377.000.
Dolorgiet Beteiligungs GmbH: *See*—
Kunz, Wilhelm; and Gruber, Klaus, 4,371,545, Cl. 424-330.000.
Donges, Reinhard, to Hoechst Aktiengesellschaft. 2-(Halogenomethyl-phenyl)-4-halogeno-oxaxole derivatives, a process for the preparation thereof, and radiation-sensitive compositions containing these derivatives. 4,371,606, Cl. 430-281.000.
Donges, Reinhard, to Hoechst Aktiengesellschaft. 4-Halogeno-5-(halogenomethyl-phenyl)-oxazole derivatives, a process for the preparation thereof, and radiation-sensitive compositions containing these derivatives. 4,371,607, Cl. 430-281.000.
Donzis, Byron A., to American Pneumatics Co. Variable pressure pad. 4,370,754, Cl. 2-2.000.
Dore, Jacques P., to Automobiles Peugeot; and Automobiles Citroen S.A. Sliding universal joints, particularly for automobile transmissions. 4,371,356, Cl. 464-111.000.
Dorris, F. Hoyt. Track roller system. 4,371,362, Cl. 474-198.000.
Dougier, Patrick: *See*—
Chamard, Alex; Dougier, Patrick; and Monteil, Jean-Bruno, 4,371,5e7, Cl. 427-130.000.
Doussot, Michel; and Courtois, Christian, to U.S. Philips Corporation. Thin-structure aerial. 4,371,877, Cl. 343-770.000.
Dow Chemical Company, The: *See*—
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,371,537, Cl. 424-263.000.
Russell, Robert J., 4,371,663, Cl. 525-95.000.
Dowding, John G.; and Preston, Edward G., to Molins Limited. Perforation of web material, especially uniting paper for making ventilated filter cigarettes. 4,370,942, Cl. 118-40.000.
Doyen, Joel; and Raisin, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche. Handling installation for bringing a piece to a receiving station in a predetermined position. 4,371,159, Cl. 271-228.000.
Doyle, Thomas J.: *See*—
Morningstar, Marion G.; and Doyle, Thomas J., 4,371,677, Cl. 526-80.000.
Draftex Development A.G.: *See*—
Niemanns, Gerd, 4,370,833, Cl. 49-489.000.
Drechsel, Erhart K.: *See*—
Sardisco, John B.; and Drechsel, Erhart K., 4,371,512, Cl. 423-551.000.
Dresser Industries, Inc.: *See*—
Sankey, Edwin W.; and Whittingham, David J., 4,371,086, Cl. 212-253.000.
Drill Systems, Inc.: *See*—
Becker, Floyd W.; and Regimbal, Richard R., 4,371,041, Cl. 173-28.000.
Driver, Kenneth D.: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,370,977, Cl. 128-80.00F.
Druke, Michael B.: *See*—
Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., 4,371,925, Cl. 364-200.000.
Druschke, Wolfgang; Kerckow, Albrecht; and Stanger, Bernd, to Basf Aktiengesellschaft. Preparation of aqueous polymer dispersions having a polymer content of up to 75% by weight. 4,371,659, Cl. 524-599.000.
Dubey, Pierre, to Autelca AG. Coin checker for coins of varying diameter. 4,371,073, Cl. 194-102.000.
Dubief, Claude: *See*—
Vanlerberghe, Guy; Sebag, Henri; Zysman, Alexandre; and Dubief, Claude, 4,371,517, Cl. 424-70.000.
Dubroeucq, Georges: *See*—
Lacombat, Michel; and Dubroeucq, Georges, 4,371,264, Cl. 356-356.000.
Duda, Richard M.: *See*—
Wagner, Walter R.; and Duda, Richard M., 4,370,919, Cl. 98-122.000.
Duepro AG: *See*—
Woerwag, Peter, 4,370,777, Cl. 15-339.000.
Dufek, Wayne L.: *See*—
Lawson, Charles A., II; and Dufek, Wayne L., 4,371,496, Cl. 376-258.000.
Dugan, John M., to Rockwell International Corporation. NRZ Data phase detector. 4,371,974, Cl. 375-82.000.
Dugan, John M., to Rockwell International Corporation. Sampling NRZ data phase detector. 4,371,975, Cl. 375-120.000.
Duhl, David N.; and Nguyen-Dinh, Xuan, to United Technologies Corporation. Single crystal nickel superalloy. 4,371,404, Cl. 148-3.000.
Dull, Ernst H.: *See*—
Bube, Carsten; Dull, Ernst H.; Thiele, Gerd; and Zeller, Hans, 4,371,910, Cl. 361-106.000.
Du Mayne, James D.: *See*—
Gregory, George K. E.; Peach, James M.; and Du Mayne, James D., 4,371,516, Cl. 424-22.000.
Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Burton C.; and Frazer, August H., 4,371,690, Cl. 528-190.000.
Baxter, Warren N.; Merckling, Nicholas G., deceased; Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., 4,371,680, Cl. 526-159.000.
Bither, Tom A., Jr., 4,371,702, Cl. 549-260.000.
Chang, David C., 4,371,657, Cl. 524-512.000.
Finizio, Michael, 4,371,541, Cl. 424-273.00R.
Jaffe, Edward E., 4,371,642, Cl. 524-88.000.
Levitt, George, 4,371,391, Cl. 71-93.000.
Nazarenko, Nicholas, 4,371,459, Cl. 252-514.000.
Rapoport, Morris, 4,371,474, Cl. 260-465.80R.
Renner, Carl A., 4,371,605, Cl. 430-280.000.
Robinson, Ivan M., 4,371,687, Cl. 528-79.000.
Selby, Thomas P., 4,371,736, Cl. 544-316.000.
Wolfe, James R., Jr., 4,371,692, Cl. 528-289.000.
Wolfe, James R., Jr., 4,371,693, Cl. 528-292.000.
Dupuis, Robert C. Pocket-size chess game. 4,371,168, Cl. 273-239.000.
Durkin, William N.: *See*—
Taylor, G. Brandt, 4,371,623, Cl. 435-290.000.

Duvdevani, Ilan: *See*—
Boyer, Gerard A. M.; Duvdevani, Ilan; and Muller, Jean-Marie A., 4,371,641, Cl. 524-70.000.
Dynamit Nobel AG: *See*—
Steffen, Klaus-Dieter; and Thallmeier, Manfred, 4,371,709, Cl. 568-33.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Schaefer, Hans; and Budich, Wolfgang, 4,370,830, Cl. 49-413.000.
Spielau, Paul; Vohwinkel, Horst; and Kuhnel, Werner, 4,371,654, Cl. 524-296.000.
E.G.O. Elektro-Berate Blanc u. Fischer: *See*—
Gossler, Gerhard; Petri, Heinz; and Mayer, Hans, 4,371,780, Cl. 219-446.000.
E M I Limited: *See*—
Voles, Roger, 4,370,914, Cl. 89-41.0TV.
E. R. Squibb & Sons, Inc.: *See*—
Rovnyak, George C., 4,371,526, Cl. 424-200.000.
Rovnyak, George C., 4,371,543, Cl. 424-319.000.
E-Y Laboratories, Inc.: *See*—
Chu, Albert E., 4,371,515, Cl. 436-544.000.
Early, Judson H.: *See*—
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,371,074, Cl. 198-339.000.
East, Anthony J.: *See*—
Calundann, Gordon W.; and East, Anthony J., 4,371,660, Cl. 524-601.000.
Eastman, Alan D.; and Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic compounds employing alumina promoted with zinc, titanium, cobalt and molybdenum as the catalytic agent. 4,371,458, Cl. 252-439.000.
Eastman, Alan D., to Phillips Petroleum Company. Dehydrogenation of organic compounds with a zinc silicate catalyst. 4,371,730, Cl. 585-627.000.
Eastman Kodak Company: *See*—
Anagnostopoulos, Constantine N.; and Ranadive, Deepak K., 4,371,890, Cl. 357-59.000.
Clem, Katherine V., 4,371,740, Cl. 136-256.000.
Day, Pierce B.; and Marsiglio, Carl M., 4,371,253, Cl. 355-4.000.
Mir, Jose M., 4,371,892, Cl. 358-75.000.
Morse, Theodore H., 4,371,251, Cl. 355-3.0TR.
Eaton Corporation: *See*—
Gritter, David J., 4,371,824, Cl. 318-722.000.
Ebauches S.A.: *See*—
Laesser, Claude; Zafferri, Roberto; and Depery, Jean, 4,371,821, Cl. 318-696.000.
Eberle, William J., to General Battery Corporation. Method for enveloping the plates of an automotive storage battery with separator material. 4,370,803, Cl. 29-623.400.
EC Erdolchemie GmbH: *See*—
Herwig, Jens; Schleppinghoff, Bernhard; and Scheef, Hans-Volker, 4,371,725, Cl. 568-907.000.
Eckersley, Colin. Placer mining sluice. 4,371,435, Cl. 209-44.000.
Eckert, Wolfgang; Holtkamp, Bernd; and Kilian, Ernst A., to U.S. Philips Corporation. Circuit arrangement for eliminating turn-on and turn-off clicks in an amplifier. 4,371,841, Cl. 330-51.000.
Eckhardt, Frizt, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Incandescent lamp with mechanically attached base. 4,371,807, Cl. 313-318.000.
ECS Telecommunications, Inc.: *See*—
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,371,752, Cl. 179-7.1TP.
Edamura, Mizuo: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,371,787, Cl. 422-186.060.
Eder, Ulrich: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.
Edgely Aircraft Limited: *See*—
Edgley, John K., 4,371,133, Cl. 244-54.000.
Edgley, John K., to Edgely Aircraft Limited. Ducted propeller aircraft. 4,371,133, Cl. 244-54.000.
Edmonds, James T., Jr.; and Scoggins, Lacey E., to Phillips Petroleum Company. Preparation of alkali metal aminoalkanoates. 4,371,706, Cl. 562-553.000.
Edmunds, Gregory A. Latch mechanism and vandal resistant housing. 4,370,873, Cl. 70-163.000.
Edo-Aire Mitchell: *See*—
Younkin, James R., 4,370,815, Cl. 33-318.000.
Edwards, Gordon L., Jr.; and Smith, Walter A., to NCR Corporation. Method and apparatus for detecting and correcting errors in a memory. 4,371,963, Cl. 371-50.000.
Edwards, Howard W. Tilt mount for mounting an outboard motor on the side of a canoe. 4,371,349, Cl. 440-56.000.
Effex Innovation A/S: *See*—
Helshoj, Egon, 4,371,028, Cl. 165-10.000.
Eggensperger, Heinz: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,371,547, Cl. 424-333.000.
Ehlers, Helmut H.: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,371,547, Cl. 424-333.000.
Ehrecke, Kevin L.: *See*—
Cain, Darryl F.; and Ehrecke, Kevin L., 4,371,299, Cl. 410-44.000.
Eibeck, Richard E.; Robinson, Martin A.; Evans, Francis E.; and Recla, Eugene B., to Allied Corporation. Process for the conversion of boron trifluoride dimethyl ether complex to the boron trifluoride dialkyl ether complex. 4,371,707, Cl. 568-6.000.
Eichner, Falk J., to Eichner Organization KG. Rotary magazine assembly for holding information bearing cards. 4,370,821, Cl. 40-497.000.
Eichner Organization KG: *See*—
Eichner, Falk J., 4,370,821, Cl. 40-497.000.
Eidschun, Charles D., to Micro-Plate, Inc. Continuous processing of printed circuit boards. 4,371,422, Cl. 156-640.000.
Elbe, Hans-Ludwig: *See*—
Kramer, Wolfgang; and Elbe, Hans-Ludwig, 4,371,708, Cl. 568-31.000.
Electro-Motion, Inc.: *See*—
Kruger, Johann, 4,371,820, Cl. 318-468.000.
Electro-Plasma, Inc.: *See*—
Muehlberger, Erich, 4,371,563, Cl. 427-34.000.
Elmer, Ben R.: *See*—
Biard, James R.; and Elmer, Ben R., 4,371,847, Cl. 330-307.000.
Eltra Corporation: *See*—
Roberts, William J., 4,371,833, Cl. 324-161.000.
Emerson Electric Co.: *See*—
Tuggle, Lloyd H., 4,370,855, Cl. 60-317.000.
Emhart Industries, Inc.: *See*—
Lipp, Ellis P.; and Utken, Jay, 4,371,862, Cl. 338-174.000.
Empire Enterprises, Inc.: *See*—
Grossman, Harold; Merrill, Richard E.; and Monaghan, Paul B., 4,371,632, Cl. 523-164.000.
Endoh, Masayuki: *See*—
Matsumoto, Shuichi; Yasuda, Kenji; Endoh, Masayuki; and Harada, Kunihiro, 4,371,713, Cl. 568-614.000.
Energy Development Associates, Inc.: *See*—
Chi, Michael C.; and Carr, Peter, 4,371,825, Cl. 320-5.000.
Engelbart, Wilhelm. Trouser pressing apparatus. 4,371,102, Cl. 223-73.000.
Engels, Bernd; Heise, Friedrich; and Cremer, Heinz P., to Keiper Automobiltechnik GmbH & Co. KG. Brake-type spring coupling for adjustment gears, particularly in seat adjusters. 4,371,065, Cl. 192-8.00C.
Engelstoft, Mogens: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.
Engineered Air Systems, Inc.: *See*—
Fisher, J. D., 4,370,863, Cl. 62-89.000.
Enomoto, Tadao; and Kasai, Hidefumi, to Citizen Watch Company Limited. Timepiece hand manufacturing method. 4,371,429, Cl. 204-4.000.
Erickson, Bert K., to General Electric Company. Self aligning bandpass filtering system. 4,371,980, Cl. 455-208.000.
Erickson, Dale L. Suspensory urinal sheath expander. 4,370,979, Cl. 128-303.00A.
Erlichman, Irving, to Polaroid Corporation. Modular production line unit and system. 4,371,075, Cl. 198-345.000.
Ermilov, Nikolai P.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.
Esaki, Leo; and Chang, Chin-An, to United States of America, Army. InAs-GaSb Tunnel diode. 4,371,884, Cl. 357-12.000.
Escher Wyss GmbH: *See*—
Kruppa, Claus; and Wuhrer, Wolfgang, 4,371,350, Cl. 440-69.000.
Escher Wyss Limited: *See*—
Sedlacek, Franz; Oertle, Jakob; and Cebulla, Dietrich, 4,371,115, Cl. 239-524.000.
Essilor International Cie Generale d'Optique: *See*—
Lhospice, Bernard, 4,371,238, Cl. 351-106.000.
Estel Hoogovens BV: *See*—
Van Laar, Jacobus, 4,371,334, Cl. 432-95.000.
Etablissements Georges Klein: *See*—
Ulmann, Jean-Pierre, 4,370,825, Cl. 49-47.000.
Etablissements M. Muller & Cie: *See*—
Coetsier, Paul; and Ravarotto, Robert, 4,370,883, Cl. 73-117.000.
Etablissements Nativelle S.A.: *See*—
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,371,538, Cl. 424-267.000.
ETC, Incorporated: *See*—
Spangler, Paul J.; and Koslo, Robert C., 4,371,229, Cl. 339-223.00R.
Etcheparre, Bernard: *See*—
Etcheparre, Jean; and Etcheparre, Bernard, 4,370,932, Cl. 105-163.0SK.
Etcheparre, Jean; and Etcheparre, Bernard, to Lectra Systemes S.A. Apparatus for the interconnection of two mobile carriers guided by parallel rails. 4,370,932, Cl. 105-163.0SK.
Ethyl Corporation: *See*—
Zaiko, Edward J.; and Ranken, Paul F., 4,371,473, Cl. 260-465.00G.
Evans, Francis E.: *See*—
Eibeck, Richard E.; Robinson, Martin A.; Evans, Francis E.; and Recla, Eugene B., 4,371,707, Cl. 568-6.000.
Everest & Jennings, Inc.: *See*—
Rodaway, Keith S., 4,370,790, Cl. 29-157.00T.

Evjen, Joseph L., Jr.: *See*—
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.
Ex-Cell-O Corporation: *See*—
Brennan, Michael J., 4,371,359, Cl. 464-136.000.
Exxon Production Research Company: *See*—
Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., 4,371,038, Cl. 166-380.000.
Exxon Research and Engineering Co.: *See*—
Agarwal, Pawan K.; and Makowski, Henry S., 4,371,640, Cl. 524-66.000.
Agarwal, Pawan K., 4,371,652, Cl. 524-216.000.
Boyer, Gerard A. M.; Davdevani, Ilan; and Muller, Jean-Marie A., 4,371,641, Cl. 524-70.000.
Faccini, Ernest C.; and Wergen, Thomas E., to United States of America, Navy. Cutting torch and method. 4,371,771, Cl. 219-70.000.
Fadeev, Petr Y.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.
Fadeev, Vladimir Y.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.
Fahey, Dennis M., to PPG Industries, Inc. Aqueous treating composition for glass fiber yarns and treated yarns. 4,371,584, Cl. 428-392.000.
Faigle, Heinz, to Heinz Faigle KG. Arrangement in pairs of plastic sliding on plastic in tribologic systems. 4,371,445, Cl. 252-12.000.
Fan, John C. C.; Geis, Michael W.; and Tsaur, Bor-Yeu, to Massachusetts Institute of Technology. Lateral epitaxial growth by seeded solidification. 4,371,421, Cl. 156-624.000.
Fang, San-Chin; and Fraser, Donald L., Jr., to Bell Telephone Laboratories, Incorporated. Semiconductor differential amplifier circuit with feedback bias control. 4,371,843, Cl. 330-253.000.
Fannin, Michael L.: *See*—
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,371,752, Cl. 179-7.1TP.
Farabaugh, Aloysius W., to PPG Industries, Inc. Method of determining optical quality of a shaped article. 4,371,482, Cl. 264-40.100.
Farber, Mark L., to Jeneric Industries, Inc. Precious metal recovery apparatus. 4,371,436, Cl. 209-268.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrogenation of olefins, hydrodesulfurization of organic sulfur compounds and/or selective removal of hydrogen sulfide from fluid streams. 4,371,507, Cl. 423-230.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., to Phillips Petroleum Company. Selective removal of olefins over zinc titanate promoted with selected metals. 4,371,728, Cl. 585-258.000.
Farneti, Arrigo: *See*—
Cane, Alessandro; and Farneti, Arrigo, 4,371,101, Cl. 222-636.000.
Fasano, Michael C., to Porta Systems Corp. Bridge lifter module. 4,371,756, Cl. 179-35.000.
Federal Paper Board Company, Inc.: *See*—
Kulig, Francis V., 4,371,110, Cl. 229-31.0FS.
Feiler, Horst; and Konig, Gunter, to Zinser-Textilmaschinen GmbH. Yarn winding device. 4,371,121, Cl. 242-18.0DD.
Feldkamper, Richard, to Windmoller & Holscher. Apparatus for securing to format cylinders format plates for the accurate transfer of applications of adhesive. 4,370,787, Cl. 29-124.000.
Felice, Leo C. Positive stop center. 4,370,907, Cl. 82-33.00R.
Fermeglia, Gildo; and Spector, George. Barrier extension adapter. 4,371,284, Cl. 403-301.000.
Ferris, Daniel B.; Trossman, Martin M.; and Luchsinger, Charles R., to Synergistics Research Corporation. Cylindrical puzzle. 4,371,166, Cl. 273-157.00R.
Ferrofluidics Corporation: *See*—
Sibley, Clifton B.; and Bell, Robert P., 4,371,502, Cl. 422-249.000.
Fiat Auto S.p.A.: *See*—
Giacosa, Dante, 4,371,361, Cl. 474-201.000.
Tornatore, Giovanni; and Bogetti, Lorenzo, 4,371,828, Cl. 322-32.000.
Fiberglas Canada, Inc.: *See*—
Schuller, Marius C., 4,371,122, Cl. 242-43.00R.
Fibun B.V.: *See*—
Davidson, Roderick I., 4,371,869, Cl. 340-557.000.
Fichtel & Sachs AG: *See*—
Handke, Gunther; and Hepp, Hans, 4,371,280, Cl. 403-13.000.
Fichter, Peter K.: *See*—
Czumak, Frank M.; and Fichter, Peter K., 4,371,249, Cl. 354-304.000.
Fields, Ellis K.; and Nimry, Tayseer S., to Standard Oil Company (Indiana). Adducts of 1-cyclohexene-1,2-dicarboxylic anhydride with olefins. 4,371,701, Cl. 549-235.000.
Fievez, Andre. Apparatus for use in producing cup-shaped pastries. 4,371,327, Cl. 425-218.000.
Fikentscher, Rolf: *See*—
Hertel, Otto; Scharf, Emil; Melzer, Jaroslav; and Fikentscher, Rolf, 4,371,674, Cl. 525-435.000.
Filhol, Stuart J. Dental anchoring means. 4,371,342, Cl. 433-225.000.
Fillman, Harold T., to Atlas Powder Company. Low water emulsion explosive compositions optionally containing inert salts. 4,371,408, Cl. 149-21.000.
Finike Italiana Marposs S.p.A.: *See*—
Possati, Mario, 4,370,812, Cl. 33-169.00R.
Finizio, Michael, to Du Pont de Nemours, E. I., and Company. Antiinflammatory and/or analgesic 3,4-dihydro-(or 1,4-dihydro)-4-aryl-2-((substituted)thio)-(1)-benzopyrano(3,4-d)imidazoles and their corresponding sulfoxides and sulfones. 4,371,541, Cl. 424-273.00R.
Firmenich SA: *See*—
Naf, Ferdinand; Decorzant, Rene; and Schulte-Elte, Karl H., 4,371,460, Cl. 252-522.00R.
First Inertia Switch Limited: *See*—
Jackman, Peter R.; and Crick, David W., 4,371,763, Cl. 200-61.45R.
Fischer, Berthold; Kabelitz, Hans-Peter; and Schmitz, Andreas, to Leybold Heraeus GmbH. Spiral rotation displacement machine with parallel motion devices ensuring relative torsional rigidity. 4,371,323, Cl. 418-55.000.
Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Paper web threading apparatus for rotary printing machines. 4,370,927, Cl. 101-228.000.
Fischer & Porter Co.: *See*—
Schmoock, Roy F., 4,370,892, Cl. 73-861.120.
Fischer, William C.: *See*—
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,936, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,937, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,939, Cl. 364-434.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,371,938, Cl. 364-434.000.
Fisher, J. D., to Engineered Air Systems, Inc. Air conditioner. 4,370,863, Cl. 62-89.000.
Fishman, Iosif D.: *See*—
Ivanov, Valentin A.; Khodosh, Vladimir A.; Shenkman, Mikhail Y.; Kirbatov, Vladimir L.; and Fishman, Iosif D., 4,371,290, Cl. 405-150.000.
Fjallbrant, Tore. Apparatus for transforming, transferring and re-transforming of a sampled signal. 4,371,973, Cl. 375-58.000.
Flow Industries, Inc.: *See*—
Olsen, John H., 4,371,001, Cl. 137-512.300.
Fock, Jurgen; Schedlitzki, Dietmar; Holtschmidt, Ulrich; and Ahrens, Wilhelm, to Th. Goldschmidt AG. Hardenable adhesive. 4,371,683, Cl. 528-60.000.
Foglia, Thomas A.; Perlstein, Theodore; Nakano, Yoshio; and Maerker, Gerhard, to United States of America, Agriculture. Process for the preparation of branched chain fatty acids and esters. 4,371,469, Cl. 260-405.600.
Forbes, Brian K.: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,371,931, Cl. 364-200.000.
Forchielli, Americo L., to Petrolite Corporation. Polishes/polish restorers. 4,371,398, Cl. 106-10.000.
Ford Aerospace & Communications Corporation: *See*—
Rubin, Michael D., 4,371,839, Cl. 329-104.000.
Ford Motor Company: *See*—
Strasser, Robert A.; and Goch, Stephen W., 4,370,930, Cl. 102-530.000.
Fordsmand, Marc. Heat exchanger, particularly for heat pumps. 4,371,036, Cl. 165-163.000.
Forestal, Robert J.: *See*—
Martin, Verble C.; and Forestal, Robert J., 4,370,842, Cl. 52-514.000.
Forsythe, Curtis J., to Top-Scor Products, Inc. Stearoyl lactylate salt composition having improved physical properties and method of production. 4,371,561, Cl. 426-653.000.
Foscolos, Georges V.: *See*—
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,371,538, Cl. 424-267.000.
Foster, Donald D.; and Magers, Wallace F., to Realex Corporation. Size-compensating collar in a pump dispenser. 4,371,099, Cl. 222-321.000.
Fowler, Jacky L.: *See*—
Principe, William L.; and Fowler, Jacky L., 4,371,309, Cl. 414-676.000.
Fram Corporation: *See*—
Thornton, Donald I., 4,371,439, Cl. 210-232.000.
Francotyp GmbH: *See*—
Denzin, Horst, 4,371,416, Cl. 156-441.500.
Frank, Dieter, to Robert Bosch GmbH. Circuit for decreasing the effect of parasitic capacitances in field effect transistors used in coupling networks. 4,371,797, Cl. 307-577.000.
Franklin Corrugated Design, Inc.: *See*—
Wright, Vester L., III, 4,371,369, Cl. 493-373.000.
Fraser, Alberto, to Commonwealth of Puerto Rico. Beach mat. 4,370,767, Cl. 5-417.000.
Fraser, Donald L., Jr.: *See*—
Fang, San-Chin; and Fraser, Donald L., Jr., 4,371,843, Cl. 330-253.000.
Frates, Paul S.: *See*—
Scholl, Charles H.; and Frates, Paul S., 4,371,096, Cl. 222-190.000.
Frazer, August H.: *See*—
Anderson, Burton C.; and Frazer, August H., 4,371,690, Cl. 528-190.000.
Fredrickson, Howard J., to Cornelius Cannon, Inc. Display rack. 4,371,085, Cl. 211-149.000.

Freel, John: *See*—
Montagna, John C.; Galli, Robert D.; and Freel, John, 4,371,428, Cl. 203-51.000.
Freeman, Bobby J.: *See*—
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Jackson, Timothy; and Zipoy, William L., 4,371,932, Cl. 364-200.000.
Freeman, Timothy J.; Goler, William J.; and Humberstone, Kenneth J. Laminated clevis pin. 4,371,202, Cl. 294-82.00R.
Freer, Charles S., Jr.: *See*—
Brann, John J.; Freer, Charles S., Jr.; and Jensen, Warren W., 4,371,929, Cl. 364-200.000.
Freimuth, John H.: *See*—
Campbell, Willis R.; Freimuth, John H.; Diederich, Anthony F., Jr.; and Jennings, Richard E., 4,370,848, Cl. 56-341.000.
Freisler, Erhard, to Ruti Machinery Works Ltd. Gripper head for looms working with removal of the filling thread from stationary bobbins. 4,371,008, Cl. 139-348.000.
Freitag, Dieter: *See*—
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, 4,371,691, Cl. 528-196.000.
Fretwell, Jack W., Jr. Yieldable load release connector. 4,370,783, Cl. 24-201.0TR.
Frias, Robert; Minnis, C. W.; Hawkins, A. Hubert; and Davis, Wendell, to Ingram Corporation. Pipe handling apparatus. 4,371,302, Cl. 414-22.000.
Frick, Richard H.; Hill, Randolph J.; and Roland, David R., to Kimberly-Clark Corporation. Differentially stretched elastic. 4,371,417, Cl. 156-495.000.
Frick, Roger L., to Rosemount Inc. Capacitive pressure transducer with isolated sensing diaphragm. 4,370,890, Cl. 73-718.000.
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Preparation of polycarbonate from specific crude bisphenols. 4,371,691, Cl. 528-196.000.
Friedman, Herman H.; Giacone, Joseph; Cante, Charles J.; and Frost, John R., to General Foods Corporation. Method for improving the functionality of protein materials. 4,371,562, Cl. 426-656.000.
Friello, Dominick R.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., 4,371,549, Cl. 426-3.000.
Fritz Eichenauer GmbH and Co. KG: *See*—
Roller, Hanno; and Nauerth, Karl-Heinz, 4,371,777, Cl. 219-298.000.
Fritzinger, George H. Traffic-actuated control systems providing an advance signal to indicate when the direction of traffic will change. 4,371,863, Cl. 340-43.000.
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., to ACF Industries, Incorporated. Railway car fabrication facility. 4,371,303, Cl. 414-281.000.
Frost, John R.: *See*—
Friedman, Herman H.; Giacone, Joseph; Cante, Charles J.; and Frost, John R., 4,371,562, Cl. 426-656.000.
Fruehman, Peter G.: *See*—
Martin, Verble C.; and Forestal, Robert J., 4,370,842, Cl. 52-514.000.
Fry, Jeremy J.; and Smith, Peter R., to Rotork Controls Limited. Drive mechanisms, more particularly for valve actuators. 4,370,902, Cl. 74-625.000.
Fryer, Rodney I.: *See*—
Walser, Armin; and Fryer, Rodney I., 4,371,468, Cl. 260-239.0BD.
Fuchs, Ralph W.: *See*—
Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, 4,371,861, Cl. 338-25.000.
Fuji Metal Mfg. Co., Ltd.: *See*—
Mese, Hisayoshi; and Kanaya, Shigeo, 4,371,146, Cl. 251-209.000.
Fuji Photo Film Co., Ltd.: *See*—
Oosaka, Shigenori; and Murakoshi, Makoto, 4,371,239, Cl. 353-26.00R.
Sugiyama, Masatoshi; Nakanishi, Ichiro; Ogawa, Akira; and Makekawa, Masakazu, 4,371,582, Cl. 428-341.000.
Toyoda, Takashi; Itoh, Isamu; and Yamada, Minoru, 4,371,610, Cl. 430-445.000.
Fujii, Setsuro: *See*—
Unemi, Norio; Kitazato, Kenji; and Fujii, Setsuro, 4,371,535, Cl. 424-251.000.
Fujikawa, Hroaki: *See*—
Nakagaki, Noboru; and Fujikawa, Hroaki, 4,370,871, Cl. 66-202.000.
Fujikawa, Katsuhisa: *See*—
Kago, Yoshiyuki; Akita, Sigeyuki; and Fujikawa, Katsuhisa, 4,371,835, Cl. 324-174.000.
Fujikawa, Kenji, to Canon Kabushiki Kaisha. Moving picture camera in which constant speed zooming is effected. 4,371,241, Cl. 352-140.000.
Fujimoto, Kenichi: *See*—
Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, 4,371,726, Cl. 585-3.000.
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, to Taiho Pharmaceutical Company Limited. Pharmaceutical composition containing 1,1,3,5-substituted biuret compound. 4,371,544, Cl. 424-322.000.
Fujioka, Kazuyoshi; and Ikkatai, Mitsuo, to Nissan Motor Company, Limited. Wet multiple disc clutch device for a vehicle transmission. 4,371,066, Cl. 192-85.0AA.
Fujisawa, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. ROM Controlled protective relay system for power transmission network. 4,371,947, Cl. 364-900.000.
Fujisawa Pharmaceutical Company, Ltd.: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,371,531, Cl. 424-246.000.
Fujishima, Toshihiko: *See*—
Tone, Fumihiro; and Fujishima, Toshihiko, 4,371,662, Cl. 525-89.000.
Fujita, Takafumi: *See*—
Ishida, Jiro; and Fujita, Takafumi, 4,371,143, Cl. 248-638.000.
Fujita, Teizo; Dohmoto, Hidetaka; and Toyoda, Shigeru, to Izumi Denki Corporation. Process stepping sequential controller. 4,371,922, Cl. 364-144.000.
Fujitsu Limited: *See*—
Ikubo, Hiroyuki; and Wada, Kunihiko, 4,371,403, Cl. 148-1.500.
Maeda, Kohichi; and Yoshida, Masanobu, 4,371,956, Cl. 365-185.000.
Masuda, Sigefumi, 4,371,233, Cl. 350-96.180.
Sasaki, Nobuo, 4,371,955, Cl. 365-185.000.
Fukuda, Goro: *See*—
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, 4,371,452, Cl. 252-373.000.
Fukuda, Tsuguo; and Hirano, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Method for producing a lithium tantalate single crystal. 4,371,419, Cl. 156-617.0SP.
Fukuda, Yoshiaki: *See*—
Inukai, Takao; Fukuda, Yoshiaki; and Ono, Mikiya, 4,371,484, Cl. 264-44.000.
Fukuura, Yukio: *See*—
Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, 4,371,411, Cl. 156-281.000.
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., to General Foods Corporation. Malt-like flavor from cereal grain root cultures. 4,371,551, Cl. 426-28.000.
Funakoshi, Satoshi: *See*—
Uemura, Yahiro; Goto, Takashi; Kano, Yoshiaki; and Funakoshi, Satoshi, 4,371,520, Cl. 424-85.000.
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., to Molex Incorporated. Electrical harness fabrication apparatus. 4,370,806, Cl. 29-749.000.
Fung, Anthony K.: *See*—
Plattner, Jacob J.; Pernet, Andre G.; and Fung, Anthony K., 4,371,546, Cl. 424-330.000.
Funk, Gary L.: *See*—
Stewart, William S.; Funk, Gary L.; and Smith, Dexter E., 4,371,944, Cl. 364-502.000.
Furuhata, Hiroshi: *See*—
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, 4,370,985, Cl. 128-663.000.
Furuitsu, Satoshi: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,371,787, Cl. 422-186.060.
Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,371,664, Cl. 525-100.000.
Furukawa, Naoki: *See*—
Ando, Hirohito; and Furukawa, Naoki, 4,371,467, Cl. 260-165.000.
Furukubo, Tatsumi, to Toyota Jidosha Kabushiki Kaisha. Engine cooling system and control valve assembly providing mixed or unmixed head and block cooling. 4,370,950, Cl. 123-41.080.
Furuminato, Kozo, to Yoshida Kogyo K K. Weathertight door assembly. 4,370,827, Cl. 49-368.000.
Fusee, Murray C., to W. R. Grace & Co. Enzymatic diagnostic composition. 4,371,611, Cl. 435-14.000.
Gabano, Jean-Paul, to Gipelec. Primary cell of high energy density in which the anode active material is an alkali metal. 4,371,592, Cl. 429-91.000.
Gabriele, Joseph M.: *See*—
Wanchik, Joseph; and Gabriele, Joseph M., 4,370,976, Cl. 128-77.000.
Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating child resistant closure. 4,371,088, Cl. 215-220.000.
Gado, Istvan: *See*—
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.
GAF Corporation: *See*—
Chiddix, Max E., 4,371,723, Cl. 568-861.000.
Gaku, Morio; and Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition comprising cyanate ester and acrylic alkenyl ester. 4,371,689, Cl. 528-162.000.
Galli, Robert D.: *See*—
Montagna, John C.; Galli, Robert D.; and Freel, John, 4,371,428, Cl. 203-51.000.
Gallin, Paul G., to Art Cap Company, Inc. Multiple ply garrison cap. 4,370,756, Cl. 2-195.000.
Gamble, Edward B., to Sperry Corporation. Bandwidth control circuitry for radar i-f amplifier. 4,371,846, Cl. 330-278.000.
Gammon, Michael W.; and Clarke, John A., to Metallurgical Process Limited; and I.S.C. Smelting Limited. Blast furnace smelting of zinc. 4,371,151, Cl. 266-186.000.
Gander, Jean-Gabriel, to LGZ Landis & Gyr Zug AG. Transmitting signals over alternating current power networks. 4,371,867, Cl. 340-310.00R.

Gardikes, John J.; and Kim, Young D., to Ashland Oil, Inc. Composition containing furfuryl alcohol and use thereof in foundry binders. 4,371,648, Cl. 523-144.000.
Gardner, Lloyd E.: *See*—
Eastman, Alan D.; and Gardner, Lloyd E., 4,371,458, Cl. 252-439.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., 4,371,507, Cl. 423-230.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., 4,371,728, Cl. 585-258.000.
Gates, James L.: *See*—
Parrish, William J.; and Gates, James L., 4,371,885, Cl. 357-24.000.
GATX Tank Erection Corporation: *See*—
Ogarek, Bernard C.; and Heisterberg, Milton W., 4,371,090, Cl. 220-224.000.
Gauthier, Gilbert: *See*—
Grapin, Jean P.; Gauthier, Gilbert; and Deltruc, Francis, 4,371,120, Cl. 241-284.000.
Gavin, Derek G., to Coal Industry (Patents) Limited. Fuel oils from coal. 4,371,727, Cl. 585-14.000.
Gazzani, Giovanni, to Crinos Industria Farmabiologica S.p.A. Carriers for spermicidal substances. 4,371,518, Cl. 424-78.000.
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; and Stahlhofen, Willi, to Gesellschaft fur Strahlen-und Umweltforschung mbH Munchen. Method and apparatus for determining the deposition of particles in the respiratory tract and/or for checking the function of the respiratory tract. 4,370,986, Cl. 128-716.000.
Gebruder Lodige Maschinenbau Gesellschaft mit beschrankter Haftung: *See*—
Beckschulte, Heinrich; and Schluter, Wilhelm, 4,370,945, Cl. 118-303.000.
Geessink, Bernard T. Cheese mould and/or follower with roughened inner surface and method for making same. 4,371,490, Cl. 264-162.000.
Geis, Michael W.: *See*—
Fan, John C. C.; Geis, Michael W.; and Tsaur, Bor-Yeu, 4,371,421, Cl. 156-624.000.
Geissler, Udo M., to Patent-Treuhand-Gesellschaft fuer elektrische Gluhlampen mbH. Electronic flash gun structure. 4,371,811, Cl. 315-241.00P.
Gelina, Robert P., to Apollo Molded Products. Double-seal molded plastic screw cap. 4,371,091, Cl. 220-288.000.
General Battery Corporation: *See*—
Eberle, William J., 4,370,803, Cl. 29-623.400.
Oxenreider, Terry R.; and Bush, Herbert A., Jr., 4,371,591, Cl. 429-88.000.
General Binding Corporation: *See*—
Wang, James C.; Murfitt, Donald; Livingston, Paul H.; and Joson, Luis K., 4,371,194, Cl. 281-21.00R.
Wang, James C.; Murfitt, Donald; and Livingston, Paul H., 4,371,195, Cl. 281-21.00R.
General Dynamics Corporation/Convair Div.: *See*—
Woods, Eugene L.; and Magnuson, Gustav D., 4,371,943, Cl. 364-481.000.
General Electric Company: *See*—
Balko, Edward N.; and Moulthrop, Lawrence C., 4,371,433, Cl. 204-228.000.
Betts, Joseph E.; and Holub, Fred F., 4,371,653, Cl. 524-268.000.
De Wolf, Frank T.; and Kimberlin, Dan W., 4,371,799, Cl. 310-154.000.
Erickson, Bert K., 4,371,980, Cl. 455-208.000.
Gerry, Otto F., 4,371,067, Cl. 192-93.00A.
Kushner, Gerald J.; and Raleigh, Edward, 4,371,199, Cl. 285-382.200.
Lenzing, Richard S., 4,371,855, Cl. 335-132.000.
May, John E.; and Zohler, Steven R., 4,371,860, Cl. 338-21.000.
Mullersman, Ferdinand H.; and Scholefield, Clifford L., 4,371,827, Cl. 320-48.000.
Richter, Eike, 4,371,801, Cl. 310-156.000.
Rosenquist, Niles R.; and Tyrell, John A., 4,371,650, Cl. 524-162.000.
General Foods Corporation: *See*—
Friedman, Herman H.; Giacone, Joseph; Cante, Charles J.; and Frost, John R., 4,371,562, Cl. 426-656.000.
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,371,551, Cl. 426-28.000.
Oppy, Maureen A.; and Nelson, Dayle A. S., 4,371,557, Cl. 426-321.000.
Pitchon, Eara; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., 4,371,556, Cl. 426-311.000.
General Motors Corporation: *See*—
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Genex Corporation: *See*—
Hecht, Randy I., 4,371,462, Cl. 260-112.00R.
George Fischer Aktiengesellschaft: *See*—
Rohr, Jakob, 4,371,212, Cl. 301-9.0DN.
George, Richard D.; and Vanhulle, Gary L., to Skytrends, Inc. Pivotal roof vent panel apparatus. 4,371,204, Cl. 296-218.000.
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May, Adolf; Voetz, Franz J.; and Gerl, August, 4,371,399, Cl. 106-109.000.
Gerlach, Klaus: *See*—
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Gerry, Otto F., to General Electric Company. Drive arrangement for a washing machine. 4,371,067, Cl. 192-93.00A.
Gesellschaft fur Strahlen-und Umweltforschung mbH Munchen: *See*—
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; and Stahlhofen, Willi, 4,370,986, Cl. 128-716.000.
Giacone, Joseph: *See*—
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Pitchon, Eara; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., 4,371,556, Cl. 426-311.000.
Giacosa, Dante, to Fiat Auto S.p.A. Metal belt for drive transmission. 4,371,361, Cl. 474-201.000.
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Gierut, Lawrence G.: *See*—
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, 4,371,754, Cl. 179-18.0EE.
Gifford, Richard L.; and Councilman, Richard R., to Brunswick Corporation. Drag system for spinning style fishing reel. 4,371,124, Cl. 242-84.51A.
Gilbard, Jeffrey P. Keratoconjunctivitis sicca therapy. 4,371,522, Cl. 424-153.000.
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Hostert, Richard J.; Mathiasmeier, Michael J.; and Gilbert, Robert J., 4,371,082, Cl. 211-22.000.
Giles, Duane D.; and Osborn, Richard W. Apparatus for making composition logs by compressing particles. 4,371,328, Cl. 425-344.000.
Gilliatt, Charles L., to Raytheon Company. Adjustable microwave oven door seal. 4,371,770, Cl. 219-10.55D.
Gilling, Donald A.; and McCaskill, Albert G., to James River-Dixie/-Northern, Inc. Package including product support insert. 4,371,553, Cl. 426-124.000.
Gipelec: *See*—
Gabano, Jean-Paul, 4,371,592, Cl. 429-91.000.
Gipson, Robert M.: *See*—
McEntire, Edward E.; and Gipson, Robert M., 4,371,704, Cl. 549-518.000.
Glasbergen, Johannes W.: *See*—
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Glaxo Group Limited: *See*—
Collington, Eric W.; Hallet, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,371,530, Cl. 424-244.000.
Gleim, Robert D.; and Gray, Richard T., to Rohm and Haas Company. Zero valent metal recovery with polyacetylene. 4,371,393, Cl. 75-108.000.
Glynn, Christopher. Sound producing instrument. 4,370,912, Cl. 84-418.000.
Gmelin, Karl; Stiefel, Peter; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Fuel injection system. 4,370,967, Cl. 123-452.000.
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Godlewski, Harry H. Motor securing device for watercraft. 4,371,144, Cl. 248-641.000.
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Goeft, Manfred; and Maurer, Dieter, to Zahnradfabrik Friedrichshafen A.G. Steering axle. 4,371,049, Cl. 180-255.000.
Goguen, Robert P. Swimming pool/spa selector valve. 4,371,003, Cl. 137-625.460.
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Odendaal, David F., 4,371,289, Cl. 405-150.000.
Goldberg, Edward M.: *See*—
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Goldberg, Jerome; and Bloch, Christopher D., to Springhill Laboratories, Inc. Adjusting automobile suspension system. 4,371,191, Cl. 280-707.000.
Goldenberg, Yasha F.: *See*—
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Goldner, Richard. Pointless end pin adaptor for the violoncello and the string bass. 4,370,911, Cl. 84-280.000.
Goler, William J.: *See*—
Freeman, Timothy J.; Goler, William J.; and Humberstone, Kenneth J., 4,371,202, Cl. 294-82.00R.
Gollinger, Wolfgang, to ITT Industries, Inc. Monolithic integrated circuit. 4,371,794, Cl. 307-269.000.
Gonzalvo, Sulpicio A. Water-driven brush. 4,370,771, Cl. 15-29.000.
Goodyear Tire & Rubber Company, The: *See*—
Balogh, George F., 4,371,733, Cl. 585-860.000.
Gorczyca, Edward. Tension model device. 4,371,344, Cl. 434-302.000.
Gordiski, Ronald J.; Bennett, Robert G., Jr.; Parrella, Alfred T.; and Bagnall, Michael, to USM Corporation. Control apparatus for roll grinders. 4,371,941, Cl. 364-475.000.
Gorkiewicz, Mitchell F. Retractable scissors tong mechanism. 4,371,222, Cl. 312-211.000.
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Gossler, Gerhard; Petri, Heinz; and Mayer, Hans, to E.G.O. Elektro-Berate Blanc u. Fischer. Multi-element cooking unit with control device. 4,371,780, Cl. 219-446.000.
Gotje, Egbert B. G. W.; and Kerstens, Franciscus N. A., to U.S. Philips Corporation. Magnetron having a filter on the output probe. 4,371,848, Cl. 331-91.000.
Goto, Takashi: *See*—
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Gough & Co. (Hanley) Ltd.: *See*—
Gough, George T., 4,370,913, Cl. 86-45.000.
Gough, George T., to Gough & Co. (Hanley) Ltd. Ammunition handling system. 4,370,913, Cl. 86-45.000.
Goulart, Joseph G. Golf club caddy. 4,371,022, Cl. 150-1.50R.
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Graf, Ronald E. Miniature fluid-controlled switch. 4,371,753, Cl. 179-18.0GF.
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Grapin, Jean P.; Gauthier, Gilbert; and Deltruc, Francis, to Ciments Lafarge France. Particle grinder with high degree of sound isolation. 4,371,120, Cl. 241-284.000.
Gratani, Francesco: *See*—
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Gravity Guidance, Incorporated: *See*—
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Green Cross Corporation, The: *See*—
Uemura, Yahiro; Goto, Takashi; Kano, Yoshiaki; and Funakoshi, Satoshi, 4,371,520, Cl. 424-85.000.
Green & Kellogg, Inc.: *See*—
McCombs, Norman R., 4,371,384, Cl. 55-179.000.
Green, Michael L.: *See*—
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Greene, Richard F.: *See*—
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Gregory, George K. E.; Peach, James M.; and Du Mayne, James D., to John Wyeth & Brother Limited. Articles for carrying chemicals. 4,371,516, Cl. 424-22.000.
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Grice, Donald G.: *See*—
Bresenham, Jack E.; Grice, Donald G.; and Pi, Shing-Chou, 4,371,933, Cl. 364-300.000.
Grimes, Ronald R.: *See*—
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Grimmell, William C.; and Kaetzel, Gilbert C., to Hoffmann-La Roche Inc. Multichannel fiber optic light guide for capsule inspection. 4,371,783, Cl. 250-227.000.
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. 5-Aminomethyl-2,3-dihydro-2-oxo-1H-imidazole-4-carboxylic acid derivatives. 4,371,737, Cl. 544-370.000.
Griscom, David L., to United States of America, Navy. Optical fiber waveguide for measuring magnetic fields. 4,371,838, Cl. 324-244.000.
Gritter, David J., to Eaton Corporation. Base drive and overlap protection circuit. 4,371,824, Cl. 318-722.000.
Grob, Ferdinand: *See*—
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Grodsky, Gerold M.; and Bringer, Jacques, to University of California, The Regents of the. Reducing the aggregation of insulin in solution. 4,371,523, Cl. 424-178.000.
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Grosse, Jurgen, to Hoechst Aktiengesellschaft. Oxidizing phosphorus compounds with chlorosulfonic acid. 4,371,509, Cl. 423-300.000.
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Grossman, Harold; Merrill, Richard E.; and Monaghan, Paul B., to Empire Enterprises, Inc. Compositions, processes, and writing elements employing resins of the thermosetting type. 4,371,632, Cl. 523-164.000.
Grossner, Horst; Kaminski, Detlef; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Ignition distributor for internal combustion engines. 4,370,965, Cl. 123-426.000.
Grove Valve and Regulator Company: *See*—
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Gruber, Klaus: *See*—
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Grunert, Hans C.; and Becker, Heinz, to Sybron Corporation. Cabinet door hinge. 4,371,223, Cl. 312-325.000.
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GTE Products Corporation: *See*—
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Broadt, David R.; and Kackenmeister, Carl F., 4,371,915, Cl. 362-15.000.
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Gurries, Raymond A., to Resonant Technology Company. Sequenced fastener installation system. 4,370,906, Cl. 81-464.000.
Gurtler, Rudolf W., to Mahle GmbH. Compression rings for pistons. 4,371,174, Cl. 277-24.000.
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Gustafsson, Berth U., to Projectus Industriprodukter AB. Device for gentle treatment of spherical balls. 4,370,772, Cl. 15-97.00R.
Gustafsson, Berth U., to AB Bonnierforetagen. Helical gear machine with improved high pressure port. 4,371,324, Cl. 418-201.000.
Gustavsson, Olle; and Sundmar, Goran, to Aktiebolaget Bofors. Tooth for ramming unit. 4,370,915, Cl. 89-47.000.
Guzik, Andrzej T., to Motorola, Inc. Method of mounting interrelated components. 4,371,912, Cl. 361-417.000.
Haas, George A.: *See*—
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Haas, Gerhard J.: *See*—
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Habib, Robert. Machines for grinding toothed cutting tools. 4,370,834, Cl. 51-165.720.
Hadary, Joseph. Toothbrush. 4,370,773, Cl. 15-172.000.
Hafner, Werner: *See*—
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Hager, Bror O. Process for the treatment of wood. 4,371,572, Cl. 427-298.000.
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Haines, Russell R., to Paco Packaging Incorporated. Childproof package for multiple products. 4,371,080, Cl. 206-531.000.
Hale, Richard A.; and Hennessey, Richard G., to International Harvester Company. Agricultural tractor having reverse air flow cooling. 4,371,047, Cl. 180-54.00A.
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Hallford, Ben R., to Rockwell International Corporation. Microwave frequency converter with economical coupling. 4,371,982, Cl. 455-327.000.
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Halliburton, Ronald D., to Bally Manufacturing Corporation. Projected gaming method and apparatus. 4,371,164, Cl. 273-121.00A.
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Hamada, Kaduto; Takata, Zitumi; and Numata, Katuhisa, to Toyoboseki Kabushiki Kaisha. Process for the production of a hollow fiber semipermeable membrane. 4,371,487, Cl. 264-49.000.
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Hamilton, William H., to Boeing Company, The. RF Shielded door seal. 4,370,831, Cl. 49-477.000.
Hamprecht, Gerhard: *See*—
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Handke, Gunther; and Hepp, Hans, to Fichtel & Sachs AG. Shackle assembly for motor vehicle compression struts. 4,371,280, Cl. 403-13.000.
Hannas, James R., to Silent Running Corporation. Infrared transmitter and control circuit. 4,371,814, Cl. 318-16.000.
Hanselmann, Dieter: *See*—
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Harbison, Charles H. Apparatus for forming structures in the form of segments of a sphere. 4,371,325, Cl. 425-63.000.
Harden, Richard L. Pivotal connection for enclosure sections. 4,371,148, Cl. 256-26.000.
Harke, Hans-Peter: *See*—
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Hart, Robert J., to Commercial Resins Company. System for spraying powder. 4,371,295, Cl. 406-128.000.
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Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. High voltage dielectrically isolated dual gate solid-state switch. 4,371,886, Cl. 357-38.000.
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. High voltage solid-state switch. 4,371,887, Cl. 357-38.000.
Hartmann, Kurt: *See*—
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Hartz, Helmut. Torsional oscillation damper for combustion-engine crankshaft. 4,370,900, Cl. 74-574.000.
Hartzell, Richard P. Exercising device. 4,371,162, Cl. 272-134.000.
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Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, to Daido Tokishuko Kabushiki Kaisha. Process for refining a molten metal. 4,371,392, Cl. 75-10.00R.
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Hashimoto, Mitsuyoshi, to Toshiba Silicones, Ltd. Room temperature curable polyorganosiloxane composition and method. 4,371,682, Cl. 528-34.000.
Hashimoto, Naoki: *See*—
Nagashima, Yoshiaki; Kimura, Yoshiomi; and Hashimoto, Naoki, 4,371,550, Cl. 426-16.000.
Hattori, Fukutaro, to Isowa Industry Co., Ltd. Printing press for printing sheets of corrugated paperboard. 4,370,926, Cl. 101-207.000.
Haussler, Wilhelm. Method for production of a compression-proof shelter and prefabricated means for use in this method. 4,370,934, Cl. 109-1.00S.
Havenith, Cornelis: *See*—
Pischinger, Franz; and Havenith, Cornelis, 4,370,958, Cl. 123-276.000.
Hawkins, A. Hubert: *See*—
Frias, Robert; Minnis, C. W.; Hawkins, A. Hubert; and Davis, Wendell, 4,371,302, Cl. 414-22.000.
Hay, Louis E.: *See*—
Mercer, Roger W.; and Hay, Louis E., 4,371,338, Cl. 433-60.000.
Hayakawa, Shizunori: *See*—
Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, 4,371,392, Cl. 75-10.00R.
Hayashi, Moriyoshi, to Yoshida Kogyo K.K. Connector assembly. 4,370,841, Cl. 52-464.000.
Hayes, Norman F.: *See*—
Collington, Eric W.; Hallet, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,371,530, Cl. 424-244.000.
Hecht, Randy I., to Genex Corporation. Method for purification of anterior pituitary hormones. 4,371,462, Cl. 260-112.00R.
Heckman, Richard W.: *See*—
Shaffer, Robert L.; and Heckman, Richard W., 4,371,163, Cl. 273-54.00B.
Heffernan, Peter C., to W. R. Grace & Co. Adjustable screed bar apparatus. 4,371,330, Cl. 425-458.000.
Heibel, Helmut, to Lucas Industries Limited. Hydraulic systems. 4,371,317, Cl. 417-298.000.
Heidt, Frederick W.: *See*—
Bien, Alfred A.; and Heidt, Frederick W., 4,370,794, Cl. 29-509.000.
Heigwer, Gerhard: *See*—
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; and Stahlhofen, Willi, 4,370,986, Cl. 128-716.000.
Heil, John, to Allcraft Plastic Company, Inc. Portable attachment for sinks. 4,370,762, Cl. 4-206.000.
Heinrich Mack Nachf. Chem-Parm. Fabrik: *See*—
Stoss, Peter, 4,371,703, Cl. 549-464.000.
Heintz, Frieder: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.
Heinz Faigle KG: *See*—
Faigle, Heinz, 4,371,445, Cl. 252-12.000.
Heise, Friedrich: *See*—
Engels, Bernd; Heise, Friedrich; and Cremer, Heinz P., 4,371,065, Cl. 192-8.00C.
Heisterberg, Milton W.: *See*—
Ogarek, Bernard C.; and Heisterberg, Milton W., 4,371,090, Cl. 220-224.000.
Helshoj, Egon, to Effex Innovation A/S. Heat storage device. 4,371,028, Cl. 165-10.000.
Henden, Derek J.; and Morris, Stuart R. Bike trailer. 4,371,184, Cl. 280-204.000.
Henderson & Sturm: *See*—
Dauel, Darold R.; Kiesling, Clarence R.; and May, Jerry L., 4,371,314, Cl. 416-20.00A.
Henkel Kommanditgesellschaft Auf Aktien: *See*—
Christophliemk, Peter; Wust, Willi; and Carduck, Franz-Josef, 4,371,510, Cl. 423-329.000.
Rose, David; Moller, Hinrich; and Maak, Norbert, 4,371,370, Cl. 8-408.000.
Hennessey, Richard G.: *See*—
Hale, Richard A.; and Hennessey, Richard G., 4,371,047, Cl. 180-54.00A.
Henriques, Joseph; and Bennett, Robert A. Rotating barbecue grill. 4,370,920, Cl. 99-339.000.
Henry, John W., IV; and Cassel, David E., to United States of America, Navy. Centrifugal pump recirculation diffuser. 4,371,310, Cl. 415-211.000.
Henson, Loyal E.: *See*—
Holler, Raymond E.; and Henson, Loyal E., 4,371,427, Cl. 203-3.000.
Henthorne, Michael; Yinger, Robert J.; and DeBold, Terry A., to Carpenter Technology Corporation. Corrosion resistant austenitic alloy. 4,371,394, Cl. 75-128.00A.
Hentz, Donald A., to Aurora Industries, Inc. Method of upgrading crude sodium bentonite. 4,371,626, Cl. 501-145.000.
Hepp, Hans: *See*—
Handke, Gunther; and Hepp, Hans, 4,371,280, Cl. 403-13.000.
Hercules Incorporated: *See*—
Cartwright, Richard V.; and Lees, Ronald D., 4,371,409, Cl. 149-94.000.
Herion-Werke KG: *See*—
Ott, Helmut, 4,371,178, Cl. 277-154.000.
Herman, Edwin B.: *See*—
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,371,551, Cl. 426-28.000.
Hermann, Claus; and Krings, Helmut, to Lingner and Fischer GmbH. Detergent-oil bath additives. 4,371,548, Cl. 424-365.000.
Herndier, Arnold W.: *See*—
Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., 4,371,020, Cl. 144-366.000.
Herrmann, Klaus M.: *See*—
Anderson, David M.; Herrmann, Klaus M.; and Somerville, Ronald L., 4,371,614, Cl. 435-108.000.
Hertel, Otto; Scharf, Emil; Melzer, Jaroslav; and Fikentscher, Rolf. Water soluble crosslinked ethyleneimine grafted polyamidoamine. 4,371,674, Cl. 525-435.000.
Herwig, Jens; Schleppinghoff, Bernhard; and Scheef, Hans-Volker, to EC Erdolchemie GmbH. Process for the preparation of tertiary olefins and n-alkanols. 4,371,725, Cl. 568-907.000.
Herzig, Ralph B.; and Cohen, Howard G. Cushion utilizing air and liquid. 4,370,769, Cl. 5-452.000.
Hetland, Timothy A.: *See*—
Ballarini, John A.; and Hetland, Timothy A., 4,371,430, Cl. 204-32.00R.
Hettinger, William P., Jr. Methods of treating cellular tissue. 4,371,519, Cl. 424-81.000.
Hewelt, Robert K.; and Dohring, Edward F., to Hewelt, Robert K. Arrangement for eliminating ammonia vapors from developed diazo copy material. 4,371,247, Cl. 354-300.000.
Heyder, Joachim: *See*—
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; and Stahlhofen, Willi, 4,370,986, Cl. 128-716.000.
Hibino, Takashi; and Ito, Yoshinori, to Hoshizaki Electric Co., Ltd. Ice-making and fresh water dispensing apparatus. 4,370,865, Cl. 62-124.000.
Hidassy, Laszlo, to Thomas & Betts Corporation. Bundling tie applying tool. 4,371,010, Cl. 140-93.00A.
Hidassy, Laszlo, to Thomas & Betts Corporation. Rotary tie carrier in a bundling tie applying tool. 4,371,011, Cl. 140-93.200.

Higashigawa, Keizo: *See*—
Shinoda, Kazuo; Higashigawa, Keizo; and Shiozawa, Ken, 4,371,000, Cl. 137-434.000.

Hilbert, Francis H., to Motorola, Inc. AM Stereophonic decoder. 4,371,747, Cl. 179-1.0GS.

Hilken, Mark A. Tropical fish egg incubator. 4,370,947, Cl. 119-3.000.

Hill, Randolph J.: *See*—
Frick, Richard H.; Hill, Randolph J.; and Roland, David R., 4,371,417, Cl. 156-495.000.

Hilleman, Terry B. Orthodontic positioner. 4,371,336, Cl. 433-6.000.

Hilligoss, Lawrence O.: *See*—
Hilligoss, William R., Jr.; and Hilligoss, Lawrence O., 4,371,751, Cl. 179-5.00R.

Hilligoss, William R., Jr.; and Hilligoss, Lawrence O., to Newart Electronic Sciences, Inc. Automatic telephonic user emergency message transmitting apparatus. 4,371,751, Cl. 179-5.00R.

Hills Industrie Limited: *See*—
Jones, Adrian D., 4,371,053, Cl. 181-249.000.

Himsley Engineering Limited: *See*—
Byleveld, Eduard, 4,371,506, Cl. 423-24.000.

Hino, Minoru; and Oshima, Takao, to Sumitomo Chemical Company, Limited; and Tohto Kasei Co., Ltd. Modified epoxy resin composition. 4,371,665, Cl. 525-109.000.

Hinokiyama, Minoru: *See*—
Nozawa, Takamitsu; Kishi, Takao; and Hinokiyama, Minoru, 4,371,098, Cl. 222-321.000.

Hiramatsu, Tsunenosuke: *See*—
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, 4,371,656, Cl. 524-443.000.

Hiramatsu, Yasuzo: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.

Hirano, Hitoshi: *See*—
Fukuda, Tsuguo; and Hirano, Hitoshi, 4,371,419, Cl. 156-617.0SP.

Hiraoka, Hideki: *See*—
Yoshimoto, Takeshi; Hiraoka, Hideki; Okazaki, Seiji; Taniguchi, Yoshihiro; and Harada, Tsutomu, 4,371,260, Cl. 355-77.000.

Hirokawa, Kazuo: *See*—
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, 4,371,452, Cl. 252-373.000.

Hirose Electric Co., Ltd.: *See*—
Yosimura, Yosikazu, 4,371,227, Cl. 339-211.000.

Hirose, Noboru, to Brother Kogyo Kabushiki Kaisha. Machine tool. 4,371,297, Cl. 408-130.000.

Hirose, Yoshiteru: *See*—
Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, 4,371,577, Cl. 428-96.000.

Hisaka Works, Limited: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,371,034, Cl. 165-108.000.

Hisaki, Masakatu: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.

Hisatsugu, Kaji; and Watanabe, Kazuhiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing spherical carbon material and spherical activated carbon. 4,371,454, Cl. 252-422.000.

Hitachi Cable, Ltd.: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Hitachi, Ltd.: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tatsumi, Hideo; and Tohkairin, Akira, 4,370,793, Cl. 29-446.000.
Kano, Takashi, 4,371,909, Cl. 361-91.000.
Kanoi, Minoru; and Hori, Yasuro, 4,371,858, Cl. 336-100.000.
Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, 4,371,319, Cl. 417-312.000.
Sakamoto, Masakatsu, 4,371,294, Cl. 406-109.000.

Hobbs, James W.: *See*—
DiBiano, Robert J.; and Hobbs, James W., 4,371,426, Cl. 203-2.000.

Hochhauser, Arthur; and Jackson, Richard B., to DCA Food Industries. Seafood product and method of producing same. 4,371,560, Cl. 426-643.000.

Hockett, Wayne B. Universal abrasive cleaning apparatus. 4,370,836, Cl. 51-410.000.

Hoeberechts, Arthur M. E.: *See*—
van Gorkom, Gerardus G. P.; and Hoeberechts, Arthur M. E., 4,370,797, Cl. 29-569.00R.

Hoechst Aktiengesellschaft: *See*—
Beck, Gerhard; Knolle, Jochen; Rupp, Richard H.; and Scholkens, Bernward, 4,371,542, Cl. 424-274.000.
Donges, Reinhard, 4,371,606, Cl. 430-281.000.
Donges, Reinhard, 4,371,607, Cl. 430-281.000.
Grosse, Jurgen, 4,371,509, Cl. 423-300.000.
Knoblauch, Wolfgang; and von Werner, Konrad, 4,371,448, Cl. 252-78.100.
Koblo, Jochen; and Schuck, Stephan, 4,371,321, Cl. 418-45.000.
Lind, Erwin; and Bader, Ilse, 4,371,599, Cl. 430-49.000.
May, Adolf; Voetz, Franz J.; and Gerl, August, 4,371,399, Cl. 106-109.000.

Hoene, Richard, to BASF Aktiengesellschaft. Preparation of cyclopentadiene/acetylenically unsaturated compound copolymers. 4,371,676, Cl. 526-76.000.

Hoffert, Robert S.: *See*—
Moyer, James D.; and Hoffert, Robert S., 4,370,936, Cl. 112-10.000.

Hoffman, Dietrich; and Sliwka, Wolfgang, to BASF Aktiengesellschaft. Microcapsule-containing wax composition. 4,371,634, Cl. 523-208.000.

Hoffmann, Carl J.: *See*—
Andrews, Michael W.; and Hoffmann, Carl J., 4,371,919, Cl. 363-65.000.

Hoffmann-La Roche Inc.: *See*—
Grimmell, William C.; and Kaetzel, Gilbert C., 4,371,783, Cl. 250-227.000.
Walser, Armin; and Fryer, Rodney I., 4,371,468, Cl. 260-239.0BD.

Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, to Schering, Aktiengesellschaft. 11-Methylene-Δ^{15}-steroids, their preparation and use in pharmaceuticals. 4,371,529, Cl. 424-243.000.

Hohn, Richard; Jung, Werner; Winter, Gerhard; and Woerner, Siegfried, to Robert Bosch, GmbH. Metalized recording carrier for recording instruments, and method of its manufacture. 4,371,879, Cl. 346-135.100.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Switch assembly including circuit test points. 4,371,856, Cl. 335-202.000.

Holland, Dennis P. Water ski tow handle. 4,371,352, Cl. 441-69.000.

Holler, Herbert: *See*—
Muhlbauer, Gerhard; and Holler, Herbert, 4,371,100, Cl. 222-591.000.

Holler, Raymond E.; and Henson, Loyal E., to Phillips Petroleum Company. Extractive distillation. 4,371,427, Cl. 203-3.000.

Holley, Joe W. Spring motor. 4,371,058, Cl. 185-11.000.

Holman, James O.: *See*—
Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, 4,371,861, Cl. 338-25.000.

Holmes, David D., to RCA Corporation. Television ghost detector system. 4,371,266, Cl. 358-167.000.

Holtkamp, Bernd: *See*—
Eckert, Wolfgang; Holtkamp, Bernd; and Kilian, Ernst A., 4,371,841, Cl. 330-51.000.

Holtschmidt, Ulrich: *See*—
Fock, Jurgen; Schedlitzki, Dietmar; Holtschmidt, Ulrich; and Ahrens, Wilhelm, 4,371,683, Cl. 528-60.000.

Holub, Fred F.: *See*—
Betts, Joseph E.; and Holub, Fred F., 4,371,653, Cl. 524-268.000.

Homecrest Industries Incorporated: *See*—
Bottemiller, Donald L.; and Miles, John K., 4,371,142, Cl. 248-573.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iwasaki, Hiroyuki; and Kasahara, Kiyoshi, 4,371,437, Cl. 210-94.000.
Ohkubo, Kiyokazu, 4,371,062, Cl. 192-3.610.

Honda Motor Co., Ltd.: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,371,822, Cl. 318-696.000.

Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, to Bridgestone Tire Company Limited. Method of adhering unvulcanized rubber to vulcanized rubber through vulcanization. 4,371,411, Cl. 156-281.000.

Honeywell Inc.: *See*—
Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, 4,371,861, Cl. 338-25.000.
Kiement, Stefan H., 4,371,850, Cl. 332-11.00D.
Shah, Prabodh L., 4,371,901, Cl. 360-65.000.

Honeywell Information Systems Inc.: *See*—
Barlow, George J.; Stanley, Philip E.; and Brown, Richard P., 4,371,928, Cl. 364-200.000.
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,371,927, Cl. 364-200.000.

Honma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Chemical copper-plating bath. 4,371,397, Cl. 106-1.230.

Honna, Takaji: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.

Hoover Universal, Inc.: *See*—
Kitchen, John P.; and Mandusky, Jack C., 4,371,152, Cl. 267-103.000.

Hopkins, Walter: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., 4,371,549, Cl. 426-3.000.

Hopper, Chester S.: *See*—
Case, Edward M.; and Hopper, Chester S., 4,371,180, Cl. 277-230.000.

Hoppner, Klaus: *See*—
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.

Hori, Yasuro: *See*—
Kanoi, Minoru; and Hori, Yasuro, 4,371,858, Cl. 336-100.000.

Horiguchi, Akira: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,371,034, Cl. 165-108.000.

Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, to Nippon Steel Chemical Co., Ltd.; and Mitsubishi Oil Co., Ltd. Composition suitable for mechanical power transmission and process for operating traction drives. 4,371,726, Cl. 585-3.000.

Hosaka, Akio, to Nissan Motor Company, Ltd. System for producing a pulse signal for controlling an internal combustion engine. 4,370,962, Cl. 123-416.000.

Hoshino, Michio: *See*—
Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, 4,371,726, Cl. 585-3.000.

Hoshizaki Electric Co., Ltd.: *See*—
Hibino, Takashi; and Ito, Yoshinori, 4,370,865, Cl. 62-124.000.

Hosiden Electronics Co., Ltd.: *See*—
Sorimachi, Mitsuo, 4,371,859, Cl. 337-365.000.

Hostert, Richard J.; Mathiasmeier, Michael J.; and Gilbert, Robert J., to Iowa State University Research Foundation, Inc. Bicycle rack. 4,371,082, Cl. 211-22.000.

Hoveland, William C.: *See*—
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.

Howe, Robert K.; and Lee, Len F., to Monsanto Company. 2-Chloro-4,5-disubstituted-thiazoles useful as herbicidal safeners. 4,371,389, Cl. 71-90.000.

Howitt, George L., to Charles Beseler Company. Digital color printer system. 4,371,259, Cl. 355-38.000.

Huber, William D., to Memorex Corporation. Equalization of DC null in reproducing a high density recording. 4,371,900, Cl. 360-40.000.

Huckins, Charles M.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,371,856, Cl. 335-202.000.

Hugel, Robert: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Hughes Aircraft Company: *See*—
Parrish, William J.; and Gates, James L., 4,371,885, Cl. 357-24.000.
Peters, John W., 4,371,587, Cl. 428-446.000.
Pitzalis, Octavius, Jr., 4,371,845, Cl. 330-277.000.

Huibers, Derk T. A., to Hydrocarbon Research, Inc. Process for producing L-sugars. 4,371,616, Cl. 435-105.000.

Hull, Maury L., to University of California. Method for programmed release in ski bindings. 4,371,188, Cl. 280-613.000.

Humberstone, Kenneth J.: *See*—
Freeman, Timothy J.; Goler, William J.; and Humberstone, Kenneth J., 4,371,202, Cl. 294-82.00R.

Hume, Peter J. Life jackets. 4,371,353, Cl. 441-117.000.

Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., to CTS Corporation. Pallet, process and apparatus for producing crystal oscillators. 4,371,078, Cl. 206-329.000.

Hunt, Ronald E.; and Jenkins, William M., to International Business Machines Corporation. Compact envelope handling device. 4,371,157, Cl. 271-2.000.

Huntzinger, Gerald O.: *See*—
Peng, Yuchi P.; Huntzinger, Gerald O.; and Hallmann, Melvin H., 4,371,804, Cl. 310-321.000.

Huser, Guido, to BBC Brown, Boveri & Company Limited. Puffer interrupter with two-piece interrupter contact. 4,371,766, Cl. 200-148.00A.

Husqvarna Aktiebolag: *See*—
Bergvall, Bengt A., 4,370,938, Cl. 112-158.00E.

Huth, Andreas: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

Hutson, Thomas, Jr., to Phillips Petroleum Company. Using butenes to fractionate methanol from methyl-tertiary-butyl ether. 4,371,718, Cl. 568-697.000.

Hutter, Charles G., III, to Products Research & Chemical Corporation. Barrier two part pairing and dispensing cartridge. 4,371,094, Cl. 222-1.000.

Hy-Reel Machinery, Inc.: *See*—
Ridgway, Lance D., 4,371,147, Cl. 254-326.000.

Hyatt, Gilbert P. Computer system architecture. 4,371,923, Cl. 364-200.000.

Hyatt, Gilbert P. Analog read only memory. 4,371,953, Cl. 365-103.000.

Hydrocarbon Research, Inc.: *See*—
Huibers, Derk T. A., 4,371,616, Cl. 435-105.000.

Hylemon, Phillip B.: *See*—
Mosbach, Erwin H.; McSherry, Charles K.; and Hylemon, Phillip B., 4,371,528, Cl. 424-241.000.

I.S.C. Smelting Limited: *See*—
Gammon, Michael W.; and Clarke, John A., 4,371,151, Cl. 266-186.000.

IAO Industrie Riunite S.p.A.: *See*—
De Martino, Ennio, 4,371,916, Cl. 362-31.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Open top refrigerated display case with ambient air defrost. 4,370,867, Cl. 62-256.000.

Ichikawa Iron Works Co., Ltd.: *See*—
Ichikawa, Michihiro, 4,371,218, Cl. 308-10.000.

Ichikawa, Michihiro, to Ichikawa Iron Works Co., Ltd. Bearing mechanism. 4,371,218, Cl. 308-10.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Tone, Fumihiro; and Fujishima, Toshihiko, 4,371,662, Cl. 525-89.000.

Igarashi, Junichi: *See*—
Iwasaki, Hidenori; Igarashi, Junichi; and Kasukawa, Shunichi, 4,371,602, Cl. 430-175.000.

Iglesias Hernandez, Eduardo. Process for binding aggregates with a vacuum-activated catalyst. 4,371,649, Cl. 523-145.000.

IIT Research Institute: *See*—
Camras, Marvin, 4,371,894, Cl. 358-342.000.

Ikari, Kunihiro: *See*—
Honma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.

Ikeda, Hiroharu; and Shimozato, Yasuyuki, to Japan Synthetic Rubber Co., Ltd. Rubber compound capable of giving a vulcanized rubber having a high modulus of elasticity. 4,371,668, Cl. 525-133.000.

Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, to Sanyo Electric Co., Ltd. Layer-built cell. 4,371,597, Cl. 429-153.000.

Ikeda, Nobuo: *See*—
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,371,769, Cl. 219-10.55F.

Ikeguchi, Nobuyuki: *See*—
Gaku, Morio; and Ikeguchi, Nobuyuki, 4,371,689, Cl. 528-162.000.

Ikeura, Kenji, to Nissan Motor Company, Limited. Fuel-cut control apparatus. 4,371,050, Cl. 180-271.000.

Ikkatai, Mitsuo: *See*—
Fujioka, Kazuyoshi; and Ikkatai, Mitsuo, 4,371,066, Cl. 192-85.0AA.

Ikubo, Hiroyuki; and Wada, Kunihiko, to Fujitsu Limited. Method of providing gettering sites through electrode windows. 4,371,403, Cl. 148-1.500.

Illger, Hans-Walter: *See*—
Konig, Klaus; Illger, Hans-Walter; Seifert, Peter; and Meyborg, Holger, 4,371,630, Cl. 521-173.000.

Imaizumi, Hiroo, to Colpo Company, Ltd. Dowell pin and method of making dental models. 4,371,340, Cl. 433-74.000.

Immink, Kornelis A.: *See*—
Dijkmans, Eise C.; and Immink, Kornelis A., 4,371,748, Cl. 179-1.00J.

Imperial Chemical Industries Limited: *See*—
Aitken, Robert M., 4,371,368, Cl. 493-298.000.
Cairns, John F., 4,371,564, Cl. 427-35.000.
McGrail, Patrick T., 4,371,489, Cl. 264-129.000.

Inagaki, Junichi: *See*—
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Okamoto, Eiichi, 4,371,926, Cl. 364-200.000.

Industrie Pirelli S.p.A.: *See*—
Borca, Bruno; and Ruscelli, Emilio, 4,371,288, Cl. 405-53.000.
Cicognani, Mario; Tangorra, Giorgio; and Cimatti, Gianfranco, 4,371,363, Cl. 474-205.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Albrile, Walter, 4,371,275, Cl. 400-161.300.

Ingram Corporation: *See*—
Frias, Robert; Minnis, C. W.; Hawkins, A. Hubert; and Davis, Wendell, 4,371,302, Cl. 414-22.000.

Ingram, Robert E. Apparatus for depositing and spreading ballast. 4,370,819, Cl. 37-104.000.

Inoue, Nori, to Tokai Electric Wire Company Limited. Electric connector. 4,371,230, Cl. 339-242.000.

Inst. Nat'l de la Sante et Recherche: *See*—
Tiollais, Pierre, 4,371,625, Cl. 435-317.000.

Institut Francais du Petrole: *See*—
Arnaudeau, Marcel, 4,371,037, Cl. 166-366.000.
Chauvin, Yves; Commereuc, Dominique; and Sugier, Andre, 4,371,627, Cl. 518-700.000.

Institut National de la Recherche Agronomique - UNRA: *See*—
Voegele, Jean D.; Jourdheuil, Pierre E. J.; Pizzol nee Dalmasso, Jeannine M.; and Pintureau, Bernard C. J., 4,370,946, Cl. 119-1.000.

Institut Pasteur: *See*—
Tiollais, Pierre, 4,371,625, Cl. 435-317.000.

International Business Machines Corporation: *See*—
Baise, Arnold I.; Burns, John M.; and Sachdev, Harbans S., 4,371,565, Cl. 427-41.000.
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.
Bohg, Armin; and Hartmann, Kurt, 4,371,857, Cl. 335-259.000.
Braun, John J.; Freer, Charles S., Jr.; and Jensen, Warren W., 4,371,929, Cl. 364-200.000.
Bresenham, Jack E.; Grice, Donald G.; and Pi, Shing-Chou, 4,371,933, Cl. 364-300.000.
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Jackson, Timothy; and Zipoy, William L., 4,371,932, Cl. 364-200.000.
Hunt, Ronald E.; and Jenkins, William M., 4,371,157, Cl. 271-2.000.
Kendall, Arthur H.; Mitchell, Joseph W.; and Sambucetti, Carlos J., 4,371,273, Cl. 400-119.000.

International Combustion Australia Limited: *See*—
Brander, James E., 4,371,800, Cl. 310-15.000.

International Flavors & Fragrances Inc.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,371,715, Cl. 568-659.000.

International Harvester Company: *See*—
Hale, Richard A.; and Hennessey, Richard G., 4,371,047, Cl. 180-54.00A.

International Standard Electric Corporation: *See*—
Barnes, Stuart R., 4,371,145, Cl. 249-80.000.
Parfree, Colin S.; and Worthington, Peter, 4,371,234, Cl. 350-96.230.
International Telephone and Telegraph Corporation: *See*—
Brancaleone, Salvatore T., 4,371,226, Cl. 339-147.00R.
Loucks, Richard S., 4,371,830, Cl. 323-265.000.
Moller, George O.; and Twiford, Richard L., 4,370,921, Cl. 99-405.000.
Shikasho, Satoru, 4,371,315, Cl. 417-5.000.
Internationale Verpakking Maatschappij BV: *See*—
Barendregt, Willem, 4,371,089, Cl. 215-256.000.
Inukai, Takao; Fukuda, Yoshiaki; and Ono, Mikiya, to Mitsubishi Mining & Cement Co., Ltd. Process for making porous sintered body of calcium phosphate. 4,371,484, Cl. 264-44.000.
Ionomet Company: *See*—
Das, Amitabha, 4,371,608, Cl. 430-315.000.
Iowa State University Research Foundation, Inc.: *See*—
Hostert, Richard J.; Mathiasmeier, Michael J.; and Gilbert, Robert J., 4,371,082, Cl. 211-22.000.
Ishida, Jiro; and Fujita, Takafumi, to Mitsubishi Steel Mfg. Co., Ltd.; and Fujita, Takafumi. Earthquake isolation floor. 4,371,143, Cl. 248-638.000.
Ishikawa, Hikaru: *See*—
Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, 4,371,411, Cl. 156-281.000.
Ishikawa, Tadashi: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,371,267, Cl. 368-74.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Takeuchi, Osamu; Kokubun, Haruo; Yoshinaga, Hisashi; Hara, Shuichi; and Ban, Hiromichi, 4,371,149, Cl. 266-90.000.
Isobe, Kimiyasu: *See*—
Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,371,621, Cl. 435-191.000.
Isowa Industry Co., Ltd.: *See*—
Hattori, Fukutaro, 4,370,926, Cl. 101-207.000.
Istvan, Sandor: *See*—
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.
Itagaki, Masato: *See*—
Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, 4,371,319, Cl. 417-312.000.
Ito, Keishi; and Yamada, Ryuji, to Kabushiki Kaisha Mitsui Miike Seisakusho. Control method for winch of mining machinery. 4,370,856, Cl. 60-389.000.
Ito, Minao: *See*—
Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, 4,371,392, Cl. 75-10.00R.
Ito, Yoshinori: *See*—
Hibino, Takashi; and Ito, Yoshinori, 4,370,865, Cl. 62-124.000.
Itoh, Isamu: *See*—
Toyoda, Takashi; Itoh, Isamu; and Yamada, Minoru, 4,371,610, Cl. 430-445.000.
Itoh, Kunio: *See*—
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,371,967, Cl. 372-45.000.
ITT Industries, Inc.: *See*—
Bienert, Herbert; Hanselmann, Dieter; Kohler, Alfred; and Prohaska, Hans, 4,370,774, Cl. 15-250.200.
Gollinger, Wolfgang, 4,371,794, Cl. 307-269.000.
Ivanov, Igor P.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
Ivanov, Valentin A.; Khodosh, Vladimir A.; Shenkman, Mikhail Y.; Kirbatov, Vladimir L.; and Fishman, Iosif D. Shuttering for establishing concrete lining of tunnels. 4,371,290, Cl. 405-150.000.
Ivic, Michael. Control for a bilge pump. 4,371,316, Cl. 417-41.000.
Iwagaki, Masaru: *See*—
Kajiwara, Makoto; Miyamoto, Akihiko; Ohbayashi, Keiji; and Iwagaki, Masaru, 4,371,609, Cl. 430-373.000.
Iwasaki, Hidenori; Igarashi, Junichi; and Kasukawa, Shunichi. Photosensitive printing plate. 4,371,602, Cl. 430-175.000.
Iwasaki, Hiroyuki; and Kasahara, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel sedimentation device. 4,371,437, Cl. 210-94.000.
Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Thermodetector. 4,371,272, Cl. 374-184.000.
Iwasaki, Sokichi: *See*—
Watanabe, Kazutomi; Iwasaki, Sokichi; and Baba, Nobuyuki, 4,370,943, Cl. 118-218.000.
Iwata, Hiroshi; Yoshino, Tsunemi; Kashihara, Toshitsugu; and Morioka, Akitoshi, to West Electric Company, Ltd. Photographing lens system with focus informing means. 4,371,245, Cl. 354-198.000.
Iwata, Toshio; and Ookawa, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control system for internal combustion engine. 4,370,963, Cl. 123-425.000.
Iwata, Yoichi, to Akebono Brake Industry Co., Ltd. Pad clip for disc brake. 4,371,060, Cl. 188-73.380.
Iwatsu Electric Co., Ltd.: *See*—
Urano, Tadao; and Kaneko, Isamu, 4,371,808, Cl. 313-411.000.
Izawa, Taketoshi: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,371,524, Cl. 424-180.000.
Izrael, Victor. Pharmaceutical composition for retarding excessive platelet aggregation. 4,371,521, Cl. 424-94.000.
Izumi Denki Corporation: *See*—
Fujita, Teizo; Dohmoto, Hidetaka; and Toyoda, Shigeru, 4,371,922, Cl. 364-144.000.
Izumi, Rokuro: *See*—
Matsumoto, Kunio; Izumi, Rokuro; Seijo, Hideji; and Mizuguchi, Hiroyuki, 4,371,612, Cl. 435-44.000.
Izumi, Toshiaki; Saito, Seitoku; Maruta, Fumio; and Kameya, Minoru, to TDK Electronics Co., Ltd. Magnetic recording medium with stepwise orientation of deposited metallic particles. 4,371,590, Cl. 428-555.000.
Jackman, Peter R.; and Crick, David W., to First Inertia Switch Limited. Inerita switch device. 4,371,763, Cl. 200-61.45R.
Jackson, Richard B.: *See*—
Hochhauser, Arthur; and Jackson, Richard B., 4,371,560, Cl. 426-643.000.
Jackson, Timothy: *See*—
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Jackson, Timothy; and Zipoy, William L., 4,371,932, Cl. 364-200.000.
Jacobsen, Orval E. Economizer with an integral gas bypass. 4,371,027, Cl. 165-1.000.
Jaeger: *See*—
Bezard, Jean-Jacques; and Delevallee, Bernard A., 4,371,834, Cl. 324-167.000.
Jaeger, Klaus, to Siemens Aktiengesellschaft. Apparatus for dot-matrix printing with proportional character spacing. 4,371,274, Cl. 400-121.000.
Jaffe, Edward E., to Du Pont de Nemours, E. I., and Company. Process for preparing polyolefin resin extended pigments. 4,371,642, Cl. 524-88.000.
Jain, Atul: *See*—
United States of America, National Aeronautics and Space Administration; and Jain, Atul, 4,371,873, Cl. 343-9.0PS.
Jakobsen, Einar. Wave motor, especially for propulsion of boats. 4,371,347, Cl. 440-9.000.
James River-Dixie/Northern, Inc.: *See*—
Gilling, Donald A.; and McCaskill, Albert G., 4,371,553, Cl. 426-124.000.
Janssens, Wilhelmus: *See*—
Van de Sande, Christian C.; Janssens, Wilhelmus; Lassig, Wolfgang; and Meier, Ernst, 4,371,604, Cl. 430-223.000.
Januschkowetz, Herbert; and Laub, Hans, to Siemens Aktiengesellschaft. Electroless deposition of nickel coatings and depositing baths therefor. 4,371,573, Cl. 427-438.000.
Japan Atomic Energy Research Institute: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ikeda, Hiroharu; and Shimozato, Yasuyuki, 4,371,668, Cl. 525-133.000.
Matsumoto, Shuichi; Yasuda, Kenji; Endoh, Masayuki; and Harada, Kunihiro, 4,371,713, Cl. 568-614.000.
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara R.T. Micromonospora culture. 4,371,622, Cl. 435-253.000.
Jarva, Inc.: *See*—
Snyder, Larry L., 4,371,211, Cl. 299-11.000.
Jeffrey, Michael J. Mobile log splitting apparatus. 4,371,019, Cl. 144-193.00A.
Jeneric Industries, Inc.: *See*—
Farber, Mark I., 4,371,436, Cl. 209-268.000.
Jenkins, John M., III; Carter, Max E., Sr.; Green, Michael L.; and Cavender, Marvin E., to Union Carbide Corporation. Method for detecting solidification in a mixed phase container. 4,371,977, Cl. 378-51.000.
Jenkins, O. C.: *See*—
Brandt, Warren J., 4,371,052, Cl. 180-287.000.
Jenkins, William M.: *See*—
Hunt, Ronald E.; and Jenkins, William M., 4,371,157, Cl. 271-2.000.
Jennings, G. Craig. Hand guard for table mounted cutting tool. 4,370,909, Cl. 83-437.000.
Jennings, Richard E.: *See*—
Campbell, Willis R.; Freimuth, John H.; Diederich, Anthony F., Jr.; and Jennings, Richard E., 4,370,848, Cl. 56-341.000.
Jensen, James D.; and Schoolar, Richard B., to United States of America, Navy. Graded gap semiconductor optical device. 4,371,232, Cl. 350-1.400.
Jensen, Warren W.: *See*—
Brann, John J.; Freer, Charles S., Jr.; and Jensen, Warren W., 4,371,929, Cl. 364-200.000.
Jentzsch, Joachim: *See*—
Marx, Karl; Winkler, Klaus; Schmidt, Kurt; and Jentzsch, Joachim, 4,371,158, Cl. 271-103.000.
Jeschar, Rudolf: *See*—
Mettig, Hermann; and Jeschar, Rudolf, 4,370,952, Cl. 123-41.840.
Jet Electronics and Technology Incorporated: *See*—
Lukso, Richard J., 4,371,978, Cl. 455-77.000.
Jinnai, Koichiro, to Ricoh Co., Ltd. Device for correcting ink dot misplacement in ink-jet printing. 4,371,878, Cl. 346-75.000.
Johansson, Leif. Surface trowelling device. 4,371,287, Cl. 404-84.000.

John Wyeth & Brother Limited: *See*—
Gregory, George K. E.; Peach, James M.; and Du Mayne, James D., 4,371,516, Cl. 424-22.000.

Johns Hopkins University, The: *See*—
Potember, Richard S.; Poehler, Theodore O., Jr.; and Cowan, Dwaine O., 4,371,883, Cl. 357-8.000.

Johnson, Edward M., Jr., to Kolcraft Products, Inc. Rockable infant seat/cradle. 4,371,206, Cl. 297-183.000.

Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 2-Hydroxy-4-(substituted) phenyl cycloalkanes and derivatives. 4,371,720, Cl. 568-731.000.

Johnson, Robert G.: *See*—
Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, 4,371,861, Cl. 338-25.000.

Johnson, Steven H., to Cobe Laboratories, Inc. Deaerating liquid. 4,371,385, Cl. 55-190.000.

Jonassen, Jorgen W. Gear-type universal coupling. 4,370,869, Cl. 464-156.000.

Jones, Adrian D., to Hills Industrie Limited. Perforate tube muffler. 4,371,053, Cl. 181-249.000.

Jones, John B., to Paraho Corporation. Zone separator for multiple zone vessels. 4,371,335, Cl. 432-95.000.

Jones, Johnny O., Jr.; and White, Charles C., Jr. Waterbed vibrator. 4,371,815, Cl. 318-114.000.

Jones, Keith A.; and Walker, Harry S., Jr., to Procter & Gamble Company, The. Liquid detergent compositions with tertiary alcohol skin feel additives. 4,371,461, Cl. 252-547.000.

Jones, Richard E., III: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,370,977, Cl. 128-80.00F.

Joo, Hong K. Musical pen. 4,371,278, Cl. 401-195.000.

Josephson, Edgar F.: *See*—
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,371,303, Cl. 414-281.000.

Joson, Luis K.: *See*—
Wang, James C.; Murfitt, Donald; Livingston, Paul H.; and Joson, Luis K., 4,371,194, Cl. 281-21.00R.

Jourdheuil, Pierre E. J.: *See*—
Voegele, Jean D.; Jourdheuil, Pierre E. J.; Pizzol nee Dalmasso, Jeannine M.; and Pintureau, Bernard C. J., 4,370,946, Cl. 119-1.000.

Joyal Products, Inc.: *See*—
Szantho, Charles F.; and Riordan, Edward D., 4,371,772, Cl. 219-89.000.

Jung, Albert, to Siemens Aktiengeselischaft. Electrically conductive connection of the active portions of an electrical component or of an integrated circuit to terminals. 4,371,231, Cl. 339-275.00R.

Jung, Werner: *See*—
Hohn, Richard; Jung, Werner; Winter, Gerhard; and Woerner, Siegfried, 4,371,879, Cl. 346-135.100.

Jungblut, Gottfried: *See*—
Moser, Robert; and Jungblut, Gottfried, 4,371,333, Cl. 432-3.000.

Kabachenko, Alexandr S.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.

Kabelitz, Hans-Peter: *See*—
Fischer, Berthold; Kabelitz, Hans-Peter; and Schmitz, Andreas, 4,371,323, Cl. 418-55.000.

Kabeshita, Akira: *See*—
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased, 4,370,804, Cl. 29-741.000.

Kabushiki Kaisha Kankyo Kaihatsu: *See*—
Muta, Natsuo; and Kanamaru, Toshihisa, 4,371,569, Cl. 427-230.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Sakashita, Masao, 4,371,745, Cl. 174-115.000.

Kabushiki Kaisha Kinrei Kikai Seisakusho: *See*—
Suzuki, Kanji, 4,370,849, Cl. 57-71.000.

Kabushiki Kaisha Meiji Gomu Kasei: *See*—
Takahashi, Munetoshi; and Kato, Takashi, 4,371,292, Cl. 405-224.000.

Kabushiki Kaisha Mitsui Miike Seisakusho: *See*—
Ito, Keishi; and Yamada, Ryuji, 4,370,856, Cl. 60-389.000.

Kabushiki-Kaisha Tokairika-Denki-Seisakusho: *See*—
Tsuge, Hiroshi; Kawaharazaki, Takashi; and Yasumatsu, Jun, 4,371,126, Cl. 242-107.200.

Kabushiki Kaisha Yakult Honsha: *See*—
Kazumi, Ozawa; and Shinichiro, No, 4,370,925, Cl. 101-40.000.

Kackenmeister, Carl F.: *See*—
Broadt, David R.; Armstrong, Donald E.; and Kackenmeister, Carl F., 4,371,914, Cl. 362-15.000.
Broadt, David R.; and Kackenmeister, Carl F., 4,371,915, Cl. 362-15.000.

Kadlec, Vlastimil; Grosser, Vojtech; and Rosenthal, Jakub, to Chemopetrol, koncernovy podnik, Chemicke zavody ceskoslovenskosovetskeho pratelstvi. Catalyst for direct hydration of ethylene to ethyl alcohol and process for preparation thereof. 4,371,456, Cl. 252-435.000.

Kaetzel, Gilbert C.: *See*—
Grimmell, William C.; and Kaetzel, Gilbert C., 4,371,783, Cl. 250-227.000.

Kafitz, Egon: *See*—
Wilking, Hans; and Kafitz, Egon, 4,371,207, Cl. 297-348.000.

Kageyama, Hidehei; and Suzuki, Takahiko, to Kotobuki & Co., Ltd. Automatic pencil. 4,371,277, Cl. 401-54.000.

Kago, Yoshiyuki; Akita, Sigeyuki; and Fujikawa, Katsuhisa, to Nippon Soken, Inc. RPM Detection system for internal combustion engine. 4,371,835, Cl. 324-174.000.

Kaise, Hirotsugu: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,371,524, Cl. 424-180.000.

Kajitani, Makoto: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.

Kajiwara, Makoto; Miyamoto, Akihiko; Ohbayashi, Keiji; and Iwagaki, Masaru, to Konishiroku Photo Industry Co., Ltd. Forming method of a dye image. 4,371,609, Cl. 430-373.000.

Kakizaki, Kimio: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Kakuichi Co. Ltd.: *See*—
Tanaka, Kenichi, 4,371,415, Cl. 156-433.000.

Kameya, Minoru: *See*—
Izumi, Toshiaki; Saito, Seitoku; Maruta, Fumio; and Kameya, Minoru, 4,371,590, Cl. 428-555.000.

Kaminski, Detlef: *See*—
Grossner, Horst; Kaminski, Detlef; and Schwerdt, Paul, 4,370,965, Cl. 123-426.000.

Kamiyama, Kiichi; and Oana, Yoshinori, to Tokyo Kogaku Kikai Kabushiki Kaisha. Apparatus for measuring curvatures of a spherical surface. 4,371,237, Cl. 351-245.000.

Kan, Kazunori: *See*—
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, 4,371,699, Cl. 548-201.000.

Kanamaru, Hisanobu; Okabe, Moisei; Tatsumi, Hideo; and Tohkairin, Akira, to Hitachi, Ltd. Method of coupling two metallic members. 4,370,793, Cl. 29-446.000.

Kanamaru, Toshihisa: *See*—
Muta, Natsuo; and Kanamaru, Toshihisa, 4,371,569, Cl. 427-230.000.

Kanaya, Shigeo: *See*—
Mese, Hisayoshi; and Kanaya, Shigeo, 4,371,146, Cl. 251-209.000.

Kandyba, Leonid F.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy L.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Kane, Bernard J.; and Von Genk, Richard A., to SCM Corporation. Cyclic terpenoid amines, their preparation and uses. 4,371,722, Cl. 568-828.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, 4,371,699, Cl. 548-201.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,371,664, Cl. 525-100.000.

Kaneko, Isamu: *See*—
Urano, Tadao; and Kaneko, Isamu, 4,371,808, Cl. 313-411.000.

Kannenberg, Karl: *See*—
Aichelmann, Dietmar; Kannenberg, Karl; Schutte, Dieter; and Volling, Axel, 4,371,503, Cl. 422-307.000.

Kanno, Ryoichi: *See*—
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, 4,370,985, Cl. 128-663.000.

Kano, Takashi, to Hitachi, Ltd. High voltage converter apparatus having overvoltage protection circuits for thyristors. 4,371,909, Cl. 361-91.000.

Kano, Yoshiaki: *See*—
Uemura, Yahiro; Goto, Takashi; Kano, Yoshiaki; and Funakoshi, Satoshi, 4,371,520, Cl. 424-85.000.

Kanoi, Minoru; and Hori, Yasuro, to Hitachi, Ltd. Static induction apparatus. 4,371,858, Cl. 336-100.000.

Kaplunov, Vadim B.: *See*—
Kuzmin, Viktor V.; Kaplunov, Vadim B.; and Ljuty, Boris I., 4,370,800, Cl. 29-598.000.

Karger, Eva R.: *See*—
Bartels-Keith, James R.; and Karger, Eva R., 4,371,603, Cl. 430-218.000.

Karger, Robert: *See*—
Weinzierl, Klaus; and Karger, Robert, 4,371,508, Cl. 423-242.000.

Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, to Centrum Konstrukcyjno-Technologiczne Maszyn Gorniczych "Komag". Dust control unit. 4,371,477, Cl. 261-30.000.

Karp, Arthur: *See*—
Cohn, Seymour B.; Karp, Arthur; and Stone, David S., 4,371,854, Cl. 333-252.000.

Karr, Lawrence J.; Wasserman, Gary L.; and Boehme, George R., to Karr, Lawrence Joseph; and Wasserman, Gary Lee. Electronic pedometer. 4,371,945, Cl. 364-561.000.

Karr, Lawrence Joseph: *See*—
Karr, Lawrence J.; Wasserman, Gary L.; and Boehme, George R., 4,371,945, Cl. 364-561.000.

Kasahara, Kiyoshi: *See*—
Iwasaki, Hiroyuki; and Kasahara, Kiyoshi, 4,371,437, Cl. 210-94.000.

Kasai, Hidefumi: *See*—
Enomoto, Tadao; and Kasai, Hidefumi, 4,371,429, Cl. 204-4.000.
Kashihara, Toshitsugu: *See*—
Iwata, Hiroshi; Yoshino, Tsunemi; Kashihara, Toshitsugu; and Morioka, Akitoshi, 4,371,245, Cl. 354-198.000.
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, to Nippon Chemical Industrial Co., Ltd.; and Kosei Co., Ltd. Metal substituted zeolites as stabilizers for halogen-containing resins. 4,371,656, Cl. 524-443.000.
Kasukawa, Shunichi: *See*—
Iwasaki, Hidenori; Igarashi, Junichi; and Kasukawa, Shunichi, 4,371,602, Cl. 430-175.000.
Kato, Takashi: *See*—
Nakamura, Norihiko; and Kato, Takashi, 4,371,479, Cl. 261-44.00C.
Takahashi, Munetoshi; and Kato, Takashi, 4,371,292, Cl. 405-224.000.
Kato, Takeshi: *See*—
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.
Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl resin composition containing silyl groups. 4,371,664, Cl. 525-100.000.
Kaufmann, Kenneth M., to Pako Corporation. Pulse width modulation speed control. 4,371,819, Cl. 318-341.000.
Kaveney, John R., Jr., to Caterpillar Tractor Co. Door lock. 4,371,205, Cl. 292-48.000.
Kawaguchi, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Dual type hydraulic circuit in a vehicle brake system. 4,371,215, Cl. 303-22.00R.
Kawaharazaki, Takashi: *See*—
Tsuge, Hiroshi; Kawaharazaki, Takashi; and Yasumatsu, Jun, 4,371,126, Cl. 242-107.200.
Kawai, Akiyoshi: *See*—
Akimoto, Hiroshi; and Kawai, Akiyoshi, 4,371,533, Cl. 424-248.540.
Kawamura, Yoshimi: *See*—
Tanaka, Kentaro; Tsuji, Naoki; Kondo, Eiji; and Kawamura, Yoshimi, 4,371,617, Cl. 435-119.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,371,787, Cl. 422-186.060.
Kawasaki, Teruo; Nomura, Hiroyuki; and Takeuchi, Mikio, to Nissan Motor Co., Ltd. Digital display device of vehicle use. 4,371,864, Cl. 340-62.000.
Kawasaki, Teruo: *See*—
Yamaki, Kiyoshi; Mizote, Masanori; Takeda, Hitoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; Kawasaki, Teruo; and Mori, Kazuyuki, 4,371,940, Cl. 364-444.000.
Kay Springs, Inc.: *See*—
Krakauer, Daniel, 4,371,153, Cl. 267-105.000.
Kazumi, Ozawa; and Shinichiro, No, to Kabushiki Kaisha Yakult Honsha. Apparatus for multiple color printing. 4,370,925, Cl. 101-40.000.
Keene Corporation: *See*—
Van Dyk, Garritt C., Jr., 4,371,175, Cl. 277-34.000.
Keeney, Bill R., to Halliburton Company. Method of and composition for acidizing subterranean formations. 4,371,443, Cl. 252-8.55C.
Keigler, John E., to RCA Corporation. Solar array spacecraft reflector. 4,371,135, Cl. 244-173.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Engels, Bernd; Heise, Friedrich; and Cremer, Heinz P., 4,371,065, Cl. 192-8.00C.
Wilking, Hans; and Kafitz, Egon, 4,371,207, Cl. 297-348.000.
Keller, Frederick A., Jr.: *See*—
Schwartz, Robert D.; and Keller, Frederick A., Jr., 4,371,619, Cl. 435-140.000.
Kelley, G. Vinson: *See*—
Valstyn, Erich P.; and Kelley, G. Vinson, 4,371,905, Cl. 360-112.000.
Kelley, James W.: *See*—
Kort, Raymond C.; and Kelley, James W., 4,371,951, Cl. 364-900.000.
Kelman, Charles D. Anterior chamber intraocular lens. 4,370,760, Cl. 3-13.000.
Kendall, Arthur H.; Mitchell, Joseph W.; and Sambucetti, Carlos J., to International Business Machines Corporation. Electrochemical printhead. 4,371,273, Cl. 400-119.000.
Kendall Company, The: *See*—
Aronica, John A., 4,370,782, Cl. 24-198.000.
Kennametal Inc.: *See*—
Leibee, Donald L., 4,371,210, Cl. 299-10.000.
Kerckow, Albrecht: *See*—
Druschke, Wolfgang; Kerckow, Albrecht; and Stanger, Bernd, 4,371,659, Cl. 524-599.000.
Kerk, Klaus; Mueller, Dieter; and Oleiko, Bernd, to Rohm GmbH. Rigid, one-piece, biaxially stretched shaped body of synthetic resin and method for making the same. 4,371,575, Cl. 428-81.000.
Kerstens, Franciscus N. A.: *See*—
Gotje, Egbert B. G. W.; and Kerstens, Franciscus N. A., 4,371,848, Cl. 331-91.000.
Keydel, Wolfgang, to Licentia Patent-Verwaltungs-GmbH. Projectile antenna. 4,371,875, Cl. 343-708.000.
Khaustov, Georgy I.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
Khodosh, Vladimir A.: *See*—
Ivanov, Valentin A.; Khodosh, Vladimir A.; Shenkman, Mikhail Y.; Kirbatov, Vladimir L.; and Fishman, Iosif D., 4,371,290, Cl. 405-150.000.
Kiesling, Clarence R.: *See*—
Dauel, Darold R.; Kiesling, Clarence R.; and May, Jerry L., 4,371,314, Cl. 416-20.00A.
Kikuchi, Toshiro; Ogawa, Masaru; and Ando, Makoto, to Toyo Boseki Kabushiki Kaisha. Process for producing acyl-coenzyme A oxidase. 4,371,620, Cl. 435-189.000.
Kilian, Ernst A.: *See*—
Eckert, Wolfgang; Holtkamp, Bernd; and Kilian, Ernst A., 4,371,841, Cl. 330-51.000.
Kilik, Ondrej: *See*—
Turza, Jozef; Kilik, Ondrej; and Rusnak, Jan, 4,371,217, Cl. 308-5.00R.
Kim, Dongsung R., to Burroughs Corporation. Apparatus for detecting, correcting and logging single bit memory read errors. 4,371,930, Cl. 364-200.000.
Kim, Leo: *See*—
Paxson, Timm E.; Kim, Leo; and Van Aken, Andre B., 4,371,716, Cl. 568-678.000.
Kim, Tong S.; and Lee, Yong N., to Borg-Warner Corporation. Distributor for plate fin evaporator. 4,370,868, Cl. 62-504.000.
Kim, Young D.: *See*—
Gardikes, John J.; and Kim, Young D., 4,371,648, Cl. 523-144.000.
Kimberlin, Dan W.: *See*—
De Wolf, Frank T.; and Kimberlin, Dan W., 4,371,799, Cl. 310-154.000.
Kimberly-Clark Corporation: *See*—
Frick, Richard H.; Hill, Randolph J.; and Roland, David R., 4,371,417, Cl. 156-495.000.
Kime, James A. Hydraulic fluid power system. 4,371,318, Cl. 417-304.000.
Kimpara, Akiyoshi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Fuel tank for reserving different kinds of fuels. 4,370,998, Cl. 137-264.000.
Kimura, Yoshiomi: *See*—
Nagashima, Yoshiaki; Kimura, Yoshiomi; and Hashimoto, Naoki, 4,371,550, Cl. 426-16.000.
King, Dennis D.; Breitwisch, Ronald L.; and Nickum, James D., to Rockwell International Corporation. Spectral squelch. 4,371,981, Cl. 455-219.000.
King, Derrick O.: *See*—
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,370,997, Cl. 137-116.300.
Kinoshita, Hirotsugu; Uemura, Hiroshi; and Sekiya, Makoto. Lubricant. 4,371,446, Cl. 252-51.50A.
Kioritz Corporation: *See*—
Takahashi, Hiroshi; and Satoh, Masatoshi, 4,370,809, Cl. 30-381.000.
Kirbatov, Vladimir L.: *See*—
Ivanov, Valentin A.; Khodosh, Vladimir A.; Shenkman, Mikhail Y.; Kirbatov, Vladimir L.; and Fishman, Iosif D., 4,371,290, Cl. 405-150.000.
Kirin Beer Kabushiki Kaisha: *See*—
Nagashima, Yoshiaki; Kimura, Yoshiomi; and Hashimoto, Naoki, 4,371,550, Cl. 426-16.000.
Kirstein, Fritz: *See*—
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Kisfaludy, Lajos: *See*—
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Kishi, Takao: *See*—
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Kitazato, Kenji: *See*—
Unemi, Norio; Kitazato, Kenji; and Fujii, Setsuro, 4,371,535, Cl. 424-251.000.
Kitchen, John P.; and Mandusky, Jack C., to Hoover Universal, Inc. Box spring assembly with improved spring installation capability. 4,371,152, Cl. 267-103.000.
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for preparing cyclohexyl phenethylether derivatives. 4,371,715, Cl. 568-659.000.
Klein, Gerald I.: *See*—
Niehenke, Edward C.; Klein, Gerald I.; and Linsenbardt, Aldo E., 4,371,851, Cl. 333-17.00L.
Klein, Richard M.: *See*—
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Kleinewefers GmbH: *See*—
Schmidt, Sylvia, 4,370,923, Cl. 100-47.000.
Tschirner, Wolfgang, 4,370,872, Cl. 68-158.000.
Klement, Stefan H., to Honeywell Inc. High accuracy delta modulator. 4,371,850, Cl. 332-11.00D.
Klockner-Humboldt-Deutz AG: *See*—
Moser, Gottfried; and Gross, Hansjurgen, 4,370,956, Cl. 123-196.0A.B.
Tholen, Paul, 4,371,112, Cl. 237-12.30A.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Mettig, Hermann; and Jeschar, Rudolf, 4,370,952, Cl. 123-41.840.
Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,371,724, Cl. 568-902.000.
Knight, Mark B., to RCA Corporation. Dual-mode control signal generating apparatus. 4,371,793, Cl. 307-260.000.
Knoblauch, Wolfgang; and von Werner, Konrad, to Hoechst Aktiengesellschaft. Hydraulic fluid composition with improved properties based on boric acid esters, glycol mono-ethers and bis-(glycolether) formals. 4,371,448, Cl. 252-78.100.
Knoll, Klaus: *See*—
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Knolle, Jochen: *See*—
Beck, Gerhard; Knolle, Jochen; Rupp, Richard H.; and Scholkens, Bernward, 4,371,542, Cl. 424-274.000.
Kobayashi, Takayuki: *See*—
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Kobe Steel, Ltd.: *See*—
Watanabe, Toshihiko; Takeuchi, Naoki; Tsuruga, Soichi; and Koishi, Tadatsugu, 4,371,107, Cl. 228-32.000.
Koblo, Jochen; and Schuck, Stephan, to Hoechst Aktiengesellschaft. Metering pump. 4,371,321, Cl. 418-45.000.
Kodaira, Kuniyasu: *See*—
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, 4,370,985, Cl. 128-663.000.
Koehnecke, Heinrich: *See*—
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Koehring GmbH: *See*—
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Koenig, Karl-Heinz: *See*—
Acker, Rolf-Dieter; Koenig, Karl-Heinz; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,371,525, Cl. 424-184.000.
Koga, Toshio, to Nippon Electric Co., Ltd. Coded video signal transmitting and receiving system. 4,371,895, Cl. 358-136.000.
Kohler, Alfred: *See*—
Bienert, Herbert; Hanselmann, Dieter; Kohler, Alfred; and Prohaska, Hans, 4,370,774, Cl. 15-250.200.
Kohler, Gisbert: *See*—
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.
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Koike, Shouichi, to Nissan Motor Co., Ltd., No. 2. Weatherstrip for vehicle closure. 4,370,832, Cl. 49-488.000.
Koishi, Tadatsugu: *See*—
Watanabe, Toshihiko; Takeuchi, Naoki; Tsuruga, Soichi; and Koishi, Tadatsugu, 4,371,107, Cl. 228-32.000.
Koizumi, Takeo: *See*—
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Kojima, Shozo: *See*—
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Kokubun, Haruo: *See*—
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Kolcraft Products, Inc.: *See*—
Johnson, Edward M., Jr., 4,371,206, Cl. 297-183.000.
Kolektor p.c.: *See*—
Potocnik, Joze, 4,370,799, Cl. 29-597.000.
Kollross, Gunter. Process and device for axial shirring of a tubular material using an air stream. 4,370,780, Cl. 17-49.000.
Komine, Yoshio: *See*—
Shimizu, Ichiro; Komine, Yoshio; and Masunaga, Makoto, 4,371,240, Cl. 352-140.000.
Komoto, Haruo: *See*—
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Komukai, Takeo: *See*—
Okazaki, Tethuharu; Komukai, Takeo; and Uchikuga, Saburo, 4,371,472, Cl. 260-453.0RY.
Kondo, Eiji: *See*—
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Kondo, Hideo: *See*—
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, 4,371,699, Cl. 548-201.000.
Kondo, Yoshiteru, to USM Corporation. Stud welding device. 4,371,773, Cl. 219-98.000.
Kondow, Ryotaro: *See*—
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Konig, Klaus; Illger, Hans-Walter; Seifert, Peter; and Meyborg, Holger, to Bayer Aktiengesellschaft. Solution of a polyurethane in a polyol and a process for using such a solution in the production of polyurethane plastics. 4,371,630, Cl. 521-173.000.
Koninklijke Emballage Industrie Van Leer B.V.: *See*—
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Konishiroku Photo Industry Co., Ltd.: *See*—
Kajiwara, Makoto; Miyamoto, Akihiko; Ohbayashi, Keiji; and Iwagaki, Masaru, 4,371,609, Cl. 430-373.000.
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Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Berzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S. Method for manufacturing a piercing mandrel. 4,370,879, Cl. 72-377.000.
Korfund Dynamics Corporation: *See*—
Barstoff, Paul, 4,371,141, Cl. 248-569.000.
Korobkov, Vladlen V.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.
Kort, Raymond C.; and Kelley, James W., to Control Data Corporation. Apparatus for converting serial input sparse vector format to parallel unpacked format for input to tandem arithmetic logic units. 4,371,951, Cl. 364-900.000.
Korte, Ralph J., to Champion International Corporation. Dispenser box with cutting edge. 4,371,104, Cl. 225-48.000.
Kosei Co., Ltd.: *See*—
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Kotobuki & Co., Ltd.: *See*—
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Kotzur, Joachim, to M.A.N. Maschinenfabrik Augsburg-Nurnburg Aktiengesellschaft. Fluid-locked shaft seal of reduced sliding speed. 4,371,173, Cl. 277-12.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Ruthrof, Klaus; and Meier, Rainer, 4,370,889, Cl. 73-619.000.
Krakau, Herbert B.: *See*—
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, 4,371,754, Cl. 179-18.0EE.
Krakauer, Daniel, to Kay Springs, Inc. Sinuous spring with depth control. 4,371,153, Cl. 267-105.000.
Kramer, Charles J., to Xerox Corporation. Fluorescent activated, spatially quantitative light detector. 4,371,897, Cl. 358-294.000.
Kramer, Donald L., to Miles Laboratories, Inc. Method and apparatus for detecting bubbles in a liquid. 4,371,786, Cl. 250-343.000.
Kramer, Wolfgang; and Elbe, Hans-Ludwig, to Bayer Aktiengesellschaft. 4-Substituted 3,3-dimethyl-butan-2-ones, processes for their preparation and their use as intermediate products. 4,371,708, Cl. 568-31.000.
Kranz, Eckart, to Bayer Aktiengesellschaft. Preparation of 1-azolyl-3,3-dimethyl-1-phenoxy-butan-2-ols. 4,371,700, Cl. 548-262.000.
Krings, Helmut: *See*—
Hermann, Claus; and Krings, Helmut, 4,371,548, Cl. 424-365.000.
Kroenke, William J., to B. F. Goodrich Company, The. Polymer compositions containing sulfate glasses or glass-ceramics. 4,371,655, Cl. 524-423.000.
Kroh, Norma J.; and Spector, George. Crocheting aid. 4,370,870, Cl. 66-1.00A.
Kroiss, Gerald C., to Magnetic Peripherals Inc. Measurement of disc servo head/data head misalignment. 4,371,960, Cl. 369-43.000.
Krone, Hartmut: *See*—
Steinicke, Wolfgang; Badura, Wolfgang; Schiessl, Alois; Weinzierl, Werner; and Krone, Hartmut, 4,370,929, Cl. 102-202.000.
Krude, Werner: *See*—
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Kruger, Johann, to Electro-Motion, Inc. Rotary line transfer switch. 4,371,820, Cl. 318-468.000.
Kruppa, Claus; and Wuhrer, Wolfgang, to Escher Wyss GmbH. Marine vessel with propeller. 4,371,350, Cl. 440-69.000.
Krywiczanin, Wladyslaw H.; and Lumsden, William, to British-American Tobacco Company Limited. Feeding web material. 4,371,418, Cl. 156-497.000.
Kubiatowicz, James F.: *See*—
Silverman, Gary S.; Zera, Robert D.; Kubiatowicz, James F.; and Claussen, Robert L., 4,371,171, Cl. 273-357.000.
Kubokawa, Masaharu. Vibration prevention handle for a vibration device. 4,371,043, Cl. 173-162.00H.
Kubota, Hiroshi. Process for preparation of fructose-containing solid sugar. 4,371,402, Cl. 127-60.000.
Kubota, Ltd.: *See*—
Mihara, Takao; Morichika, Toshiaki; and Sone, Shigenori, 4,371,775, Cl. 219-121.0PK.
Kuhlman Corporation: *See*—
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Kuhn, Eberhard: *See*—
Ahne, Hellmut; Kuhn, Eberhard; and Rubner, Roland, 4,371,685, Cl. 528-73.000.

Kuhn, Hans, to Koehring GmbH. Fluid operated ram. 4,371,042, Cl. 173-127.000.

Kuhnel, Werner: *See*—
Spielau, Paul; Vohwinkel, Horst; and Kuhnel, Werner, 4,371,654, Cl. 524-296.000.

Kulagin, Rim A.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.

Kulig, Francis V., to Federal Paper Board Company, Inc. Sheet cake tray carton. 4,371,110, Cl. 229-31.0FS.

Kullik, Gunter R. J., to Progress-Elektrogerate Mauz & Pfeiffer GmbH & Co. Vacuum cleaner for household and industrial application. 4,370,776, Cl. 15-319.000.

Kunise, Satoru: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,371,787, Cl. 422-186.060.

Kunz, Paul R. Apparatus for supplying a fuel/air mixture to an internal combustion engine. 4,370,970, Cl. 123-557.000.

Kunz, Wilhelm; and Gruber, Klaus, to Dolorgiet Beteiligungs GmbH. Isopropyl amine compounds. 4,371,545, Cl. 424-330.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hisatsugu, Kaji; and Watanabe, Kazuhiro, 4,371,454, Cl. 252-422.000.

Kuroda, Nobuyuki; Sano, Akira; Nakamura, Toru; Matsuura, Kazuo; and Miyoshi, Mituji, to Nippon Oil Company, Ltd. Process for preparing polyolefins. 4,371,679, Cl. 526-116.000.

Kuroda, Takeshi. Magnetic cylinder. 4,371,798, Cl. 310-80.000.

Kurosawa, Kei, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for producing semiconductor device. 4,371,407, Cl. 148-187.000.

Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Moromura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,371,644, Cl. 524-102.000.

Kurzov, Jury P.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.

Kurzweil, Karel: *See*—
Badet, Bernard; and Kurzweil, Karel, 4,371,744, Cl. 174-68.500.

Kushner, Gerald J.; and Raleigh, Edward, to General Electric Company. Crimped tube joint. 4,371,199, Cl. 285-382.200.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 4,371,414, Cl. 156-361.000.

Kuwakado, Satosi: *See*—
Shimogawa, Toshiaki; Ando, Takayuki; and Kuwakado, Satosi, 4,371,127, Cl. 242-107.200.

Kuzmin, Viktor V.; Kaplunov, Vadim B.; and Ljuty, Boris I. Method of balancing electrical machine rotor. 4,370,800, Cl. 29-598.000.

Kwan, Stephen C.: *See*—
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.

Kyle, James C. Electrical insulating material with hermetic seal. 4,371,588, Cl. 428-448.000.

Kyuchukov, Yanko P., to UPZ kam Vimmesa. Method of and apparatus for electroerosive production of profiled surfaces. 4,371,432, Cl. 204-129.350.

L. & C. Steinmuller GmbH: *See*—
Weinzierl, Klaus; and Karger, Robert, 4,371,508, Cl. 423-242.000.

Labbe, Claude. Vehicle frame straightening apparatus. 4,370,882, Cl 72-447.000.

Lacombat, Michel; and Dubroeucq, Georges, to Thomson-CSF. Optical system for aligning two patterns and photo-repeater using such a system. 4,371,264, Cl. 356-356.000.

Laesser, Claude; Zafferri, Roberto; and Depery, Jean, to Ebauches S.A. Electromagnetic motor rotatable in either direction. 4,371,821, Cl. 318-696.000.

Lafuma, Philippe: *See*—
Deville, Christian; and Lafuma, Philippe, 4,371,852, Cl. 333-157.000.

Laine, Norman R.: *See*—
Sanchez, Moises G.; and Laine, Norman R., 4,371,513, Cl. 423-625.000.

Lampertz, Horst. Protection chamber. 4,371,283, Cl. 403-288.000.

Lange, Wolfgang: *See*—
Mathes, Nikolaus; Lange, Wolfgang; and Gerlach, Klaus, 4,371,485, Cl. 264-46.100.

Langumier, Georges, to Travaux et Produits Routiers. Bituminous mixtures for roads with very high performances, method for producing said mixtures and their application on roads. 4,371,401, Cl. 106-281.00R.

Larguia, Constancio. Arrangement for selectively changing the radiation and vibration transmission properties of panels. 4,370,837, Cl. 52-1.000.

Larsson, Hans G.; and Westman, Erik, to ASEA Aktiebolag. Method for manufacturing billets, from metal powder, intended to be subsequently rolled or forged. 4,371,396, Cl. 419-56.000.

Lassig, Wolfgang: *See*—
Van de Sande, Christian C.; Janssens, Wilhelmus; Lassig, Wolfgang; and Meier, Ernst, 4,371,604, Cl. 430-223.000.

Laub, Hans: *See*—
Januschkowetz, Herbert; and Laub, Hans, 4,371,573, Cl. 427-438.000.

Laue, Charles E., to Hamilton-Pax, Inc. Universal joint and method of making. 4,371,358, Cl. 464-136.000.

Laurel Bank Machine Co., Ltd.: *See*—
Watanabe, Kenkichi, 4,370,990, Cl. 133-8.00A.

Laurent, Henry: *See*—
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.

Lawson, Ashby G., to United States of America, National Aeronautics and Space Administration. Modified spiral wound retaining ring. 4,371,301, Cl. 411-517.000.

Lawson, Charles A., II; and Dufek, Wayne L., to Westinghouse Electric Corp. Position indication system. 4,371,496, Cl. 376-258.000.

Lazarus, Charles R.: *See*—
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,371,551, Cl. 426-28.000.

Le Materiel Telephonique Thomson-CSF: *See*—
Paris, Philippe Y. J.; and Couturier, Alain, 4,371,343, Cl. 434-29.000.

Leaders, William M.; and Harrington, Charles D., to Uranium Recovery Corporation. Extractant and process for extracting uranium wet-process phosphoric acid. 4,371,504, Cl. 423-10.000.

LeBlanc, Edward J., III: *See*—
Willig, Roy L.; LeBlanc, Edward J., III; and Airhart, Harold, Sr., 4,371,044, Cl. 175-4.600.

Le Clair, Francis J.; and Surgant, John M., to Monsanto Company. Flowable herbicides. 4,371,390, Cl. 71-93.000.

Leco Corporation: *See*—
Bredeweg, Roger L., 4,371,971, Cl. 373-115.000.

Lectra Systemes S.A.: *See*—
Etcheparre, Jean; and Etcheparre, Bernard, 4,370,932, Cl. 105-163.0SK.

Lee, Kuo-Cheng. Cigarette lighter with flip-out windshield. 4,371,331, Cl. 431-151.000.

Lee, Len F.: *See*—
Howe, Robert K.; and Lee, Len F., 4,371,389, Cl. 71-90.000.

Lee, Patrick S., to Sperry Corporation. Self-adjusting dual mode automatic gain control circuit. 4,371,842, Cl. 330-141.000.

Lee, Richard J.; and Baranowski, Leonard J., to Standard Oil Company (Indiana). Alkylsalicylaldehyde preparation. 4,371,712, Cl. 568-430.000.

Lee, William W.; Brown, J. Martin; Martinez, Abelardo P.; and Cory, Michael J., to United States of America, Health and Human Services. Nitroimidazoles of low toxicity and high activity as radiosensitizers of hypoxic tumor cells. 4,371,540, Cl. 424-273.00R.

Lee, Yong N.: *See*—
Kim, Tong S.; and Lee, Yong N., 4,370,868, Cl. 62-504.000.

Lees, Ronald D.: *See*—
Cartwright, Richard V.; and Lees, Ronald D., 4,371,409, Cl. 149-94.000.

Leibee, Donald L., to Kennametal Inc. Freely rotatable pick bit holder on rotary driven member and method. 4,371,210, Cl. 299-10.000.

Leistner, William E.; Minagawa, Motonobu; Tsuruga, Kouji; and Harada, Masashi, to Phoenix Chemical Corporation. Stabilizer compositions and polyvinyl halide resin compositions containing 1,3-dicarbonyl compounds. 4,371,651, Cl. 524-178.000.

Lempicki, Alexander; and Klein, Richard M., to GTE Laboratories Incorporated. High neodymium content aluminophosphate glass and laser. 4,371,965, Cl. 372-40.000.

Lenk, Attila M.: *See*—
Podmaniczky, Andras; Tokes, Szabolcs; and Lenk, Attila M., 4,371,964, Cl. 372-38.000.

Lenzing, Richard S., to General Electric Company. Electrical contactor. 4,371,855, Cl. 335-132.000.

Leoncini, Novello: *See*—
Benai, Tommaso; Leoncini, Novello; and Paoletti, Ugo, 4,371,491, Cl. 264-196.000.

Le Sausse, Robert T.: *See*—
van den Berg, Johan H.; and Le Sausse, Robert T., 4,370,775, Cl. 15-250.320.

Leuthold, Albert, to Willy A. Bachofen AG. Agitator-type ball mill. 4,371,119, Cl. 241-66.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,371,391, Cl. 71-93.000.

Lewis, Kathy; and Avery, James E., to Atlantic Richfield Company. Terminal assembly for solar panels. 4,371,739, Cl. 136-251.000.

Lewis, Martyn A., to Minnesota Mining and Manufacturing Company. Spindle motor control system. 4,371,818, Cl. 318-313.000.

Lewis, Martyn A., to DMA Systems Corporation. Emergency head retract system for magnetic disc drives. 4,371,903, Cl. 360-75.000.

Leybold Heraeus GmbH: *See*—
Fischer, Berthold; Kabelitz, Hans-Peter; and Schmitz, Andreas, 4,371,323, Cl. 418-55.000.

Lezsak, Tibor: *See*—
Weiperth, Vilmos; and Lezsak, Tibor, 4,371,114, Cl. 239-309.000.

LGZ Landis & Gyr Zug AG: *See*—
Gander, Jean-Gabriel, 4,371,867, Cl. 340-310.00R.

Lhospice, Bernard, to Essilor International Cie Generale d'Optique. Spectacles frame. 4,371,238, Cl. 351-106.000.

Li, Chou H. Solid-state device. 4,371,406, Cl. 148-171.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Keydel, Wolfgang, 4,371,875, Cl. 343-708.000.

Lichtenstein, Eric S. Computer-control medical care system. 4,370,983, Cl. 128-630.000.

Liebersohn, Aaron. Bromine containing allylcarbonates. 4,371,681, Cl. 526-295.000.

Lien, Jih-Chang; and Chiu, Te-Long, to Texas Instruments Incorporated. Interlevel insulator for integrated circuit with implanted resistor element in second-level polycrystalline silicon. 4,370,798, Cl. 29-576.00B.

Liggett Group Inc.: *See*—
Siregar, John A.; and Arkoudilos, John, 4,371,558, Cl. 426-332.000.

Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Ethanol synthesis by homologation of methanol. 4,371,724, Cl. 568-902.000.

Lind, Erwin; and Bader, Ilse, to Hoechst Aktiengesellschaft. Process for the preparation of printing forms and/or metallized images. 4,371,599, Cl. 430-49.000.

Lind, Laurel R., to Magnavox Consumer Electronics Co. Circuit for processing angle modulated broadcast signals. 4,371,749, Cl. 179-1.0GS.

Lindblom, Karl T., to Ostbergs Fabriks AB. Forest thinning device. 4,371,017, Cl. 144-3.00D.

Linde Aktiengesellschaft: *See*—
Benkmann, Christian, 4,371,380, Cl. 55-26.000.

Lindner, Friedrich; and Scheunemann, Kurt, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Latent heat accumulator. 4,371,029, Cl. 165-10.000.

Lindvall, Sture S. Dip treating apparatus. 4,370,991, Cl. 134-76.000.

Lingner and Fischer GmbH: *See*—
Hermann, Claus; and Krings, Helmut, 4,371,548, Cl. 424-365.000.

Link, Lawrence R. Wall safe and door hinging means therefor. 4,370,935, Cl. 109-51.000.

Linsenbardt, Aldo E.: *See*—
Niehenke, Edward C.; Klein, Gerald I.; and Linsenbardt, Aldo E., 4,371,851, Cl. 333-17.00L.

Lion Corporation: *See*—
Matsukura, Tadaaki; and Nakagawa, Yukio, 4,371,470, Cl. 260-428.000.

Lipp, Ellis P.; and Utken, Jay, to Emhart Industries, Inc. Variable resistance control. 4,371,862, Cl. 338-174.000.

Liss, Warren A.: *See*—
Chen, I-Heng; and Liss, Warren A., 4,371,789, Cl. 307-38.000.

List, Hans: *See*—
Pomfret, Colin T., 4,370,951, Cl. 123-41.740.
Skatsche, Othmar; Wagner, Johann; and Obermayer, Bertram, 4,370,957, Cl. 123-196.0AB.
Woss, Gerhard; and Schreiber, Erich, 4,370,884, Cl. 73-117.300.

Little Giant Industries, Inc.: *See*—
Ashton, Larry J.; and Grimes, Ronald R., 4,371,055, Cl. 182-46.000.

Livingston, Paul H.: *See*—
Wang, James C.; Murfitt, Donald; Livingston, Paul H.; and Joson, Luis K., 4,371,194, Cl. 281-21.00R.
Wang, James C.; Murfitt, Donald; and Livingston, Paul H., 4,371,195, Cl. 281-21.00R.

Ljuty, Boris I.: *See*—
Kuzmin, Viktor V.; Kaplunov, Vadim B.; and Ljuty, Boris I., 4,370,800, Cl. 29-598.000.

Locke, Travis E., Sr. Image control mirror. 4,371,235, Cl. 350-280.000.

Lockheed Corporation: *See*—
Wirt, Leslie S., 4,371,054, Cl. 181-252.000.

Login, Robert B.: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,371,476, Cl. 260-709.000.

Lohest, Hans, to Barmag Barmer Maschinenfabrik AG. Apparatus and method for starting textile winder synchronous motor drives. 4,371,823, Cl. 318-705.000.

Lombardino, Joseph G.; and Harbert, Charles A., to Pfizer Inc. Certain pyridine methylthio acetaldehyde derivatives and non-cyclic and cyclic acetals thereof. 4,371,696, Cl. 546-283.000.

Longley, Stuart R., to U.S. Philips Corporation. Evanescent-mode microwave oscillator. 4,371,849, Cl. 331-96.000.

L'Oreal: *See*—
Vanlerberghe, Guy; Sebag, Henri; Zysman, Alexandre; and Dubief, Claude, 4,371,517, Cl. 424-70.000.

Lorraine, Jack R., to Bendix Corporation, The. Combination air pump and air filter. 4,371,322, Cl. 418-47.000.

Lotsch, Wolfgang: *See*—
Scherer, Hans; Lotsch, Wolfgang; and Bock, Gustav, 4,371,735, Cl. 544-300.000.

Lottick, Edward A. Electrocautery hemostat. 4,370,980, Cl. 128-303.170.

Loucks, Richard S., to International Telephone and Telegraph Corporation. High voltage charge-regulating power supply for a pulsed load. 4,371,830, Cl. 323-265.000.

Louisville Manufacturing Co., Inc.: *See*—
Melzer, Zecharia; and Rice, John E., Sr., 4,370,940, Cl. 112-286.000.

Lovegrove, Peter J., to Weatherford U.K. Limited. Safety interlock. 4,371,069, Cl. 192-135.000.

Lovette, Norris G., Jr.; and Ruprecht, David R., to Air Products and Chemicals, Inc. Spiral-type heat exchanger. 4,370,861, Cl. 62-63.000.

Lucas Industries Limited: *See*—
Brown, Peter W., 4,371,182, Cl. 280-6.00H.
Heibel, Helmut, 4,371,317, Cl. 417-298.000.
Ottewell, Gerald A., 4,371,061, Cl. 188-244.000.

Luchsinger, Charles R.: *See*—
Ferris, Daniel B.; Trossman, Martin M.; and Luchsinger, Charles R., 4,371,166, Cl. 273-157.00R.

Lucius, Gunter: *See*—
Weisbach, Gunter; Lucius, Gunter; and Plage, Dieter, 4,370,928, Cl. 101-242.000.

Lukso, Richard J., to Jet Electronics and Technology Incorporated. Automatic tuning system. 4,371,978, Cl. 455-77.000.

Lumsden, William: *See*—
Krywiczanin, Wladyslaw H.; and Lumsden, William, 4,371,418, Cl. 156-497.000.

M.A.N. Maschinenfabrik Augsburg-Nurnburg Aktiengesellschaft: *See*—
Kotzur, Joachim, 4,371,173, Cl. 277-12.000.

M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,370,927, Cl. 101-228.000.

M-O Valve Company Limited, The: *See*—
Baker, Basil O., 4,371,911, Cl. 361-124.000.

Maak, Norbert: *See*—
Rose, David; Moller, Hinrich; and Maak, Norbert, 4,371,370, Cl. 8-408.000.

MacDonald, Alexander J. R.: *See*—
Palmer, John H. W.; and MacDonald, Alexander J. R., 4,371,345, Cl. 434-368.000.

Machell, Greville, to Milliken Research Corporation. Hot melt adhesive bonded pile fabrics. 4,371,576, Cl. 428-92.000.

Machino, Yasuo: *See*—
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, 4,371,656, Cl. 524-443.000.

Mack, Mark P.; and Berge, Charles T., to Conoco, Inc. Supported catalyst for olefin polymerization. 4,371,455, Cl. 252-429.00C.

Mackay, Donald A. M.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., 4,371,549, Cl. 426-3.000.

MacMillan Bloedel Limited: *See*—
Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., 4,371,020, Cl. 144-366.000.

MacRae, Alfred U.: *See*—
Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., 4,371,886, Cl. 357-38.000.

Madsen, Erik. Method, a binder, and an apparatus for binding sausage casings. 4,370,778, Cl. 17-45.000.

Maeda, Kohichi; and Yoshida, Masanobu, to Fujitsu Limited. Semiconductor device. 4,371,956, Cl. 365-185.000.

Maeda, Masayoshi: *See*—
Miyamoto, Akira; Maeda, Masayoshi; and Yamagishi, Yoshitaka, 4,371,675, Cl. 525-472.000.

Maekawa, Masakazu: *See*—
Sugiyama, Masatoshi; Nakanishi, Ichiro; Ogawa, Akira; and Maekawa, Masakazu, 4,371,582, Cl. 428-341.000.

Maerker, Gerhard: *See*—
Foglia, Thomas A.; Perlstein, Theodore; Nakano, Yoshio; and Maerker, Gerhard, 4,371,469, Cl. 260-405.600.

Magers, Wallace F.: *See*—
Foster, Donald D.; and Magers, Wallace F., 4,371,099, Cl. 222-321.000.

Magnavox Consumer Electronics Co.: *See*—
Lind, Laurel R., 4,371,749, Cl. 179-1.0GS.

Magner, Bengt, to Opto-System AB. Rod clamp. 4,371,281, Cl. 403-219.000.

Magnetic Peripherals Inc.: *See*—
Kroiss, Gerald C., 4,371,960, Cl. 369-43.000.

Magnuson, Gustav D.: *See*—
Woods, Eugene L.; and Magnuson, Gustav D., 4,371,943, Cl. 364-481.000.

Magyar Tudomanyos Akademia Szamitastechnikai es Automatizalasi Kutato Intezete: *See*—
Podmaniczky, Andras; Tokes, Szabolcs; and Lenk, Attila M., 4,371,964, Cl. 372-38.000.

Mahaffey, Robert L., Jr., to Milliken Research Corporation. Polyolefin plastic compositions comprising meta- or papa-derivatives (choro- or bromo-) of di-benzyuidene sorbitol. 4,371,645, Cl. 524-108.000.

Mahle GmbH: *See*—
Gurtler, Rudolf W., 4,371,174, Cl. 277-24.000.

Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Company, Limited. Strip-line resonator and a band pass filter having the same. 4,371,853, Cl. 333-204.000.

Makowski, Henry S.: *See*—
Agarwal, Pawan K.; and Makowski, Henry S., 4,371,640, Cl. 524-66.000.

Maljuchenkov, Valery A.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.

Malkin, Arkady S.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Minjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Mandusky, Jack C.: *See*—
Kitchen, John P.; and Mandusky, Jack C., 4,371,152, Cl. 267-103.000.

Manly, William A., to Graham Magnetics, Inc. EMI-Suppression from transmission lines. 4,371,742, Cl. 174-36.000.

Manning, John J.; Rosin, Robert E.; and Richart, Ralph M., to RMR Systems, Inc. Fluid measuring system. 4,371,790, Cl. 307-118.000.
Manufacture de Produits Chimiques Protex: *See*—
Balland, Jean, 4,371,373, Cl. 8-650.000.
Manville Service Corporation: *See*—
Peters, Walter B., 4,371,631, Cl. 523-153.000.
Mar, John: *See*—
Sandoz, Oscar A.; and Mar, John, 4,371,957, Cl. 367-3.000.
Marello, Georges; and Vermalle, Jean-Claude, to Societe Nationale Industrielle Aerospatiale. Artificial satellite arrangement with unfoldable solar generators and antennas. 4,371,134, Cl. 244-173.000.
Marion, Charles P.: *See*—
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.
Markfeld, Udo; and Wintergerst, Siegfried, to Zahnradfabrik Friedrichshafen AG. Reversing device for a gear transmission. 4,370,896, Cl. 74-339.000.
Markley, John B. Microphone and remote control system. 4,371,750, Cl. 179-1.0VL.
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., to Dow Chemical Company, The. Sulfur-substituted phenoxypyridines having antiviral activity. 4,371,537, Cl. 424-263.000.
Marlatt, George R., to Westinghouse Electric Corp. Self rupturing gas moderator rod for a nuclear reactor. 4,371,495, Cl. 376-209.000.
Marlo Company Incorporated, The: *See*—
Case, Edward M.; and Hopper, Chester S., 4,371,180, Cl. 277-230.000.
Marritt, Clifford R.: *See*—
DeAlto, Michael E.; DiGiacomo, Joseph D.; Marritt, Clifford R.; and Preston, Edward G., 4,370,908, Cl. 83-348.000.
Marsh, Dana G.: *See*—
Schank, Richard L.; and Marsh, Dana G., 4,371,600, Cl. 430-56.000.
Marshall, Robert M.; and Dardoufas, Kimon C., to Allied Corporation. Polyamide yarn spin finish containing a glyceride and oxidized polyethylene. 4,371,658, Cl. 524-585.000.
Marsiglio, Carl M.: *See*—
Day, Pierce B.; and Marsiglio, Carl M., 4,371,253, Cl. 355-4.000.
Martin, Charles F. Apparatus for connecting tubular members. 4,371,198, Cl. 285-165.000.
Martin, Verble C.; and Forestal, Robert J., to Young, Vern R.; and Fruchman, Peter G., a part interest to each. Repair patching kit for panels. 4,370,842, Cl. 52-514.000.
Martinez, Abelardo P.: *See*—
Lee, William W.; Brown, J. Martin; Martinez, Abelardo P.; and Cory, Michael J., 4,371,540, Cl. 424-273.00R.
Maruta, Fumio: *See*—
Izumi, Toshiaki; Saito, Seitoku; Maruta, Fumio; and Kameya, Minoru, 4,371,590, Cl. 428-555.000.
Maruyama, Katsuaki, to Toyoto Jidosha Kogyo Kabushiki Kaisha. Adjustable fastening device. 4,370,898, Cl. 74-540.000.
Marx, Karl; Winkler, Klaus; Schmidt, Kurt; and Jentzsch, Joachim, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Sheet tilting suction type separator. 4,371,158, Cl. 271-103.000.
Mashimo, Yukio: *See*—
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.
Massachusetts Institute of Technology: *See*—
Fan, John C. C.; Geis, Michael W.; and Tsaur, Bor-Yeu, 4,371,421, Cl. 156-624.000.
Mast, Fred, to Gretag Aktiengesellschaft. Illuminating device for photographic copying apparatus. 4,371,258, Cl. 355-37.000.
Masuda, Sigefumi, to Fujitsu Limited. Lens-applied optical fiber connector. 4,371,233, Cl. 350-96.180.
Masugi, Takashi: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,371,531, Cl. 424-246.000.
Masukawa, Noelle K., administratrix: *See*—
Baxter, Warren N.; Merckling, Nicholas G., deceased; Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., 4,371,680, Cl. 526-159.000.
Masunaga, Makoto: *See*—
Shimizu, Ichiro; Komine, Yoshio; and Masunaga, Makoto, 4,371,240, Cl. 352-140.000.
Masutani, Kenzo: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,371,034, Cl. 165-108.000.
Mathes, Nikolaus; Pitowski, Hans J.; and Vitzthum, Gunther, to Akzona Incorporated. Process and apparatus for the separation of immiscible liquid mixtures. 4,371,441, Cl. 210-649.000.
Mathes, Nikolaus; Lange, Wolfgang; and Gerlach, Klaus, to Akzona Incorporated. Process for making hydrophilic polyester fiber. 4,371,485, Cl. 264-46.100.
Mathiasmeier, Michael J.: *See*—
Hostert, Richard J.; Mathiasmeier, Michael J.; and Gilbert, Robert J., 4,371,082, Cl. 211-22.000.
Matsukawa, Nobuo: *See*—
Daitoku, Koichi; Sekine, Kenji; Matsukawa, Nobuo; and Sugimori, Shiro, 4,371,244, Cl. 354-173.000.
Matsukura, Tadaaki; and Nakagawa, Yukio, to Lion Corporation. Method for manufacturing high quality fatty acid esters. 4,371,470, Cl. 260-428.000.
Matsumoto, Kunio; Izumi, Rokuro; Seijo, Hideji; and Mizuguchi, Hiroyuki, to Toyo Jozo Company, Ltd. Immobilization of biological material with an acrylonitrile polymer. 4,371,612, Cl. 435-44.000.
Matsumoto, Shuichi; Yasuda, Kenji; Endoh, Masayuki; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Process for the preparation of polyether glycol. 4,371,713, Cl. 568-614.000.
Matsuo, Motoyuki; Komoto, Haruo; and Mita, Yoshihisa, to Mitsubishi Denki Kabushiki Kaisha. Method of controlling the tension of a strip within furnace. 4,371,332, Cl. 432-1.000.
Matsushita Electric Industrial Company, Limited: *See*—
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,371,853, Cl. 333-204.000.
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased, 4,370,804, Cl. 29-741.000.
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,371,967, Cl. 372-45.000.
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,371,769, Cl. 219-10.55F.
Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Sano, Akira; Nakamura, Toru; Matsuura, Kazuo; and Miyoshi, Mituji, 4,371,679, Cl. 526-116.000.
Matsuura, Sadao: *See*—
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.
Mattheis, Dale B. Sound attenuator for use in conjunction with the motorcycle helmet or the like. 4,370,758, Cl. 2-423.000.
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., to ECS Telecommunications, Inc. Electronic audio communication system. 4,371,752, Cl. 179-7.1TP.
Mattson, Melvin J. Hydraulic bucket cleaner. 4,371,307, Cl. 414-725.000.
Mattson, William F., to B. F. Goodrich Company, The. Apparatus and process for vulcanizing, adjusted for variable location of point of least cure. 4,371,483, Cl. 264-40.600.
Matumoto, Hirozi: *See*—
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, 4,370,985, Cl. 128-663.000.
Mauldin, Donald M.; and Jones, Richard E., III, to Driver, Kenneth D.; and Stills, Melvin L., part interest to each. Knee and elbow brace. 4,370,977, Cl. 128-80.00F.
Maurer, Dieter: *See*—
Goeft, Manfred; and Maurer, Dieter, 4,371,049, Cl. 180-255.000.
Maxey, Donald R. Inverted channel focusing solar collector. 4,370,974, Cl. 126-439.000.
Maxwell, Harry L. Key deposit return machine. 4,371,070, Cl. 194-4.00D.
May, Adolf; Voetz, Franz J.; and Gerl, August, to Hoechst Aktiengesellschaft. Water-repellent gypsum mortar. 4,371,399, Cl. 106-109.000.
May, Jerry L.: *See*—
Dauel, Darold R.; Kiesling, Clarence R.; and May, Jerry L., 4,371,314, Cl. 416-20.00A.
May, John E.; and Zohler, Steven R., to General Electric Company. Solderable varistor. 4,371,860, Cl. 338-21.000.
Mayer, Hans: *See*—
Gossler, Gerhard; Petri, Heinz; and Mayer, Hans, 4,371,780, Cl. 219-446.000.
Maynard, Arthur D.; and Abrams, Joseph L. Energy saving water heater control circuit. 4,371,779, Cl. 219-328.000.
Maytham, Walter J., to Speed Systems, Inc. Cutting tool with wedge shaped cutting blade to reduce friction. 4,370,808, Cl. 30-353.000.
McAlinden, Daniel P.: *See*—
Montgomery, Gary V.; and McAlinden, Daniel P., 4,371,095, Cl. 222-153.000.
McAlister, Roy E. Apparatus for making plastic solar panel structure. 4,371,326, Cl. 425-71.000.
McCaskey, Harold O.; and Benson, Melvin E., to Westinghouse Electric Corp. Fire-resistant filler sheet laminates. 4,371,579, Cl. 428-204.000.
McCaskill, Albert G.: *See*—
Gilling, Donald A.; and McCaskill, Albert G., 4,371,553, Cl. 426-124.000.
McCombs, Norman R., to Green & Kellogg, Inc. Bed vessels for a compact oxygen concentrator. 4,371,384, Cl. 55-179.000.
McCoy, David R.; and Naylor, Carter G., to Texaco Inc. Process for secondary recovery. 4,371,444, Cl. 252-8.55D.
McDonnell Douglas Corporation: *See*—
Biferno, Michael A., 4,371,870, Cl. 340-716.000.
McEntire, Edward E.; and Gipson, Robert M., to Texaco Development Corporation. Substituted alkylene oxides from substituted alkylene carbonates. 4,371,704, Cl. 549-518.000.
McGrail, Patrick T., to Imperial Chemical Industries Limited. Production of anti-static thermoplastics films. 4,371,489, Cl. 264-129.000.
McGregor, William H., to American Home Products Corporation. Mammalian collagenase inhibitors. 4,371,465, Cl. 260-112.50R.
McGregor, William H., to American Home Products Corporation. Mammalian collagenase inhibitors. 4,371,466, Cl. 260-112.50R.
McGuffin, William G., to RCA Corporation. Position sensor for video disc. 4,371,959, Cl. 369-43.000.
McGuire, Patrick L.; and Barraclough, Bruce L., to United States of America, Energy. Method and apparatus for recovering unstable cores. 4,371,045, Cl. 175-17.000.
McIntyre, Donald B.; and McIntyre, Frederic S., to Acumeter Laboratories, Inc. Wide-band and continuous line adhesive applicator and

method for cigarette filter attachment and the like. 4,371,571, Cl. 427-285.000.
McIntyre, Frederic S.: *See—*
McIntyre, Donald B.; and McIntyre, Frederic S., 4,371,571, Cl. 427-285.000.
McKean, John A., to Titan Tool Co. Controlled-torque apparatus. 4,371,354, Cl. 464-36.000.
McNair, Robert J., Jr., to Avco Corporation. Two stroke cycle engine with sustained power stroke. 4,370,959, Cl. 123-295.000.
McSherry, Charles K.: *See—*
Mosbach, Erwin H.; McSherry, Charles K.; and Hylemon, Phillip B., 4,371,528, Cl. 424-241.000.
Medernach, John W.; Novak, Ivan A.; and Bush, Harry D., to Motorola, Inc. Method for fabricating aligned patterns on the opposed surfaces of a transparent substrate. 4,371,598, Cl. 430-22.000.
Medical Laboratory Automation, Inc.: *See—*
Scordato, Richard E.; and Varca, Robert J., 4,371,498, Cl. 422-102.000.
Medrad, Inc.: *See—*
Reilly, David M., 4,370,982, Cl. 604-98.000.
Meier, Dieter, to Vemag. Method and apparatus for intermittently dispensing flowable foodstuff. 4,370,779, Cl. 17-49.000.
Meier, Ernst: *See—*
Van de Sande, Christian C.; Janssens, Wilhelmus; Lassig, Wolfgang; and Meier, Ernst, 4,371,604, Cl. 430-223.000.
Meier, Rainer: *See—*
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Meixner, Hans; and Schebler, Andreas, to Siemens Aktiengesellschaft. Electric heating device employing PTC heating element for preheating of heating oil. 4,371,778, Cl. 219-302.000.
Melton, Vernon L. Cam controlled multi-axis automatic welding machine. 4,371,105, Cl. 228-7.000.
Melvin, Lawrence S., Jr.: *See—*
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,371,720, Cl. 568-731.000.
Melzer, Jaroslav: *See—*
Hertel, Otto; Scharf, Emil; Melzer, Jaroslav; and Fikentscher, Rolf, 4,371,674, Cl. 525-435.000.
Melzer, Zecharia; and Rice, John E., Sr., to Louisville Manufacturing Co., Inc. Automatic thread trimmer for computerized zigzag embroidery sewing machine. 4,370,940, Cl. 112-286.000.
Memon, Nazir A., to Rohm and Haas Company. Process for applying a silicone or siloxane-based abrasion resistant coating to a polycarbonate substrate, and coated articles. 4,371,585, Cl. 428-412.000.
Memorex Corporation: *See—*
Huber, William D., 4,371,900, Cl. 360-40.000.
Menge, Richard J. Wall support brace. 4,370,843, Cl. 52-693.000.
Mercer, Roger W.; and Hay, Louis E. Dental articulator having simplified means for mounting dental casts. 4,371,338, Cl. 433-60.000.
Mercier, Olivier, to BBC Brown, Boveri & Company, Limited. Time delay switch. 4,371,791, Cl. 307-141.000.
Merckling, Nicholas G., deceased: *See—*
Baxter, Warren N.; Merckling, Nicholas G., deceased; Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., 4,371,680, Cl. 526-159.000.
Merrell Dow Pharmaceuticals Inc.: *See—*
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,371,737, Cl. 544-370.000.
Merrill, Richard E.: *See—*
Grossman, Harold; Merrill, Richard E.; and Monaghan, Paul B., 4,371,632, Cl. 523-164.000.
Mese, Hisayoshi; and Kanaya, Shigeo, to Fuji Metal Mfg. Co., Ltd. Ball valve. 4,371,146, Cl. 251-209.000.
Metallurgical Process Limited: *See—*
Gammon, Michael W.; and Clarke, John A., 4,371,151, Cl. 266-186.000.
Mettig, Hermann; and Jeschar, Rudolf, to Klockner-Humboldt-Deutz Aktiengesellschaft. Reciprocable piston internal combustion engine with at least one cylinder bushing. 4,370,952, Cl. 123-41.840.
Meyborg, Holger: *See—*
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Meyer, Jacques: *See—*
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Michaux, Jacques M., to Sacilor-Acieries et Laminoirs de Lorraine. Rolling mill rolls. 4,370,877, Cl. 72-222.000.
Micro-Plate, Inc.: *See—*
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Midwestco, Inc.: *See—*
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Mihara, Takao; Morichika, Toshiaki; and Sone, Shigenori, to Kubota, Ltd. Method and apparatus for plasma welding. 4,371,775, Cl. 219-121.0PK.
Miles, John K.: *See—*
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Miles Laboratories, Inc.: *See—*
Kramer, Donald L., 4,371,786, Cl. 250-343.000.
Miller, Brian T.: *See—*
Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., 4,371,078, Cl. 206-329.000.
Miller, Jack V., to Gravity Guidance, Incorporated. Method for manufacturing a thermoplastic cylindrical clamp. 4,371,494, Cl. 264-522.000.
Miller, James E.: *See—*
Trussell, C. Ward, Jr.; and Miller, James E., 4,371,968, Cl. 372-50.000.
Miller, Norman, legatee: *See—*
Miller, Pauline K., deceased; and Miller, Norman, legatee, 4,371,026, Cl. 160-349.00D.
Miller, Pauline K., deceased; and by Miller, Norman, legatee. Air conditioner supported curtain holder. 4,371,026, Cl. 160-349.00D.
Miller, Robert S.: *See—*
Zarrelli, Neal; Bocassi, Joseph V.; and Miller, Robert S., 4,370,969, Cl. 123-525.000.
Miller, Terry R. Pneumatic system for compressed air driven vehicle. 4,370,857, Cl. 60-413.000.
Milliken Research Corporation: *See—*
Machell, Greville, 4,371,576, Cl. 428-92.000.
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Moore, Patrick D., 4,371,688, Cl. 528-112.000.
Smrekar, Joseph J., 4,371,371, Cl. 8-531.000.
Minagawa, Motonobu; and Nakahara, Yutaka, to Adeka Argus Chemical Co. Ltd. 2,6-Di-tertiary butyl phenyl phosphites and synthetic resin compositions having enhanced stability to heat and light. 4,371,646, Cl. 524-119.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Tobita, Etsuo, to Adeka Argus Chemical Co. Ltd. 2,6-Di-tertiary butyl phenyl pentaerythritol spiro bis-phosphites enhancing the stability to heat and light of synthetic resin. 4,371,647, Cl. 524-120.000.
Minagawa, Motonobu: *See—*
Leistner, William E.; Minagawa, Motonobu; Tsuruga, Kouji; and Harada, Masashi, 4,371,651, Cl. 524-178.000.
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Lewis, Martyn A., 4,371,818, Cl. 318-313.000.
Minnis, C. W.: *See—*
Frias, Robert; Minnis, C. W.; Hawkins, A. Hubert; and Davis, Wendell, 4,371,302, Cl. 414-22.000.
Minuto, Maurice A. Method of making bouncing silicone putty-like compositions. 4,371,493, Cl. 264-236.000.
Mir, Jose M., to Eastman Kodak Company. Light valve imaging with optimized addressing potential(s) to reduce inter-pixel nonuniformity. 4,371,892, Cl. 358-75.000.
Miro, Carl F. Window frame assembly. 4,370,828, Cl. 49-383.000.
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased (by Araki, Kaeko, administratrix), to Matsushita Electric Industrial Co., Ltd. Electronic component inserting apparatus. 4,370,804, Cl. 29-741.000.
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Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
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Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A. Percussive device. 4,370,916, Cl. 91-173.000.
Mitrofanov, Vladislav V.: *See—*
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.
Mitrovich, Svetislav; and Besty, Ronald L., to Xerox Corporation. Sheet stacking output tray. 4,371,276, Cl. 400-625.000.
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Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, 4,371,577, Cl. 428-96.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Gas Chemical Company, Inc.: *See—*
Gaku, Morio; and Ikeguchi, Nobuyuki, 4,371,689, Cl. 528-162.000.
Miyamoto, Akira; Maeda, Masayoshi; and Yamagishi, Yoshitaka, 4,371,675, Cl. 525-472.000.
Mitsubishi Mining & Cement Co., Ltd.: *See—*
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Mitsubishi Oil Co., Ltd.: *See*—
Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, 4,371,726, Cl. 585-3.000.
Mitsubishi Steel Mfg. Co., Ltd.: *See*—
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Mitsugi, Koji: *See*—
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Mitsuhashi, Yuji, to Dai Nippon Imatsu Kabushiki Kaisha. Dot percentage measuring device. 4,371,265, Cl. 356-432.000.
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Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, 4,371,577, Cl. 428-96.000.
Mitsutomi, Katsuyoshi: *See*—
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Miwa, Kiyoshi; and Momose, Haruo, to Ajinomoto Company Incorporated. Method for stabilizing the characteristics of microorganism containing a plasmid. 4,371,615, Cl. 435-115.000.
Miyake, Hidekazu: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.
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Miyamoto, Akira; Maeda, Masayoshi; and Yamagishi, Yoshitaka, to Mitsubishi Gas Chemical Company, Inc. Process for preparation of modified aromatic hydrocarbon resin. 4,371,675, Cl. 525-472.000.
Miyasaka, Hiroshi; and Yamada, Shinji, to Rhythm Watch Company Limited. Time correcting circuit for timepiece with electrochromic display. 4,371,268, Cl. 368-82.000.
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Molex Incorporated: *See*—
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Molins Limited: *See*—
DeAlto, Michael E.; DiGiacomo, Joseph D.; Marritt, Clifford R.; and Preston, Edward G., 4,370,908, Cl. 83-348.000.
Dowding, John G.; and Preston, Edward G., 4,370,942, Cl. 118-40.000.
Moller, Dieter; and Poth, Ulrich, to BASF Farben & Fasern AG. Baking lacquer. 4,371,667, Cl. 525-208.000.
Moller, George O.; and Twiford, Richard L., to International Telephone and Telegraph Corporation. Doughnut fryer guide. 4,370,921, Cl. 99-405.000.
Moller, Hinrich: *See*—
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Momose, Haruo: *See*—
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Monigold, Ray A.; and Russell, William F. Collision resistant auxiliary fuel system. 4,371,181, Cl. 280-5.00A.
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Alt, Gerhard H.; and Chupp, John P., 4,371,717, Cl. 568-681.000.
D'Amico, John J., 4,371,388, Cl. 71-90.000.
Howe, Robert K.; and Lee, Len F., 4,371,389, Cl. 71-90.000.
Le Clair, Francis J.; and Surgant, John M., 4,371,390, Cl. 71-93.000.
Montagna, John C.; Galli, Robert D.; and Freel, John, to Gulf Research & Development Company. Separating vinyltoluene from other alkenylaromatics. 4,371,428, Cl. 203-51.000.
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Montgomery, Gary V.; and McAlinden, Daniel P., to Sunbeam Plastics Corporation. One-piece child resistant closure. 4,371,095, Cl. 222-153.000.
Moore, Patrick D., to Milliken Research Corporation. Substituted cyclohexane-1,2-dicarboxylic anhydrides and epoxy resins containing same. 4,371,688, Cl. 528-112.000.
Moorehead, Eric L.: *See*—
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Moorhead, Albert B. Snake trap. 4,370,823, Cl. 43-7.000.
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Morishita, Toshihiko: *See*—
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, 4,371,656, Cl. 524-443.000.
Morningstar, Marion G.; and Doyle, Thomas J., to B.F. Goodrich Company, The. Process for making dispersion copolymers through monomer metering. 4,371,677, Cl. 526-80.000.
Moromura, Syoji: *See*—
Soma, Nobuo; Moromura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,371,644, Cl. 524-102.000.
Morrill, Charles D.; and Best, Michael J. A., to Smith International, Inc. Protective cover for underwater flow line hub. 4,371,005, Cl. 138-89.000.
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., to Smith International, Inc. Underwater flowline connector. 4,371,291, Cl. 405-169.000.
Morrill, Wayne J. Half-pitch capacitor induction motor. 4,371,802, Cl. 310-166.000.
Morris, Hayden; and Bis, Richard F., to United States of America, Navy. Process for preparing isolated junctions in thin-film semiconductors. 4,371,882, Cl. 357-4.000.
Morris, Stuart R.: *See*—
Henden, Derek J.; and Morris, Stuart R., 4,371,184, Cl. 280-204.000.
Morrison Company, Inc.: *See*—
Morrison, Donald; and Muma, William T., Jr., 4,371,580, Cl. 428-250.000.
Morrison, Donald; and Muma, William T., Jr., to Morrison Company, Inc. Three-ply belting material. 4,371,580, Cl. 428-250.000.
Morse, Theodore H., to Eastman Kodak Company. Electrographic method and apparatus providing improved transfer of non-insulative toner. 4,371,251, Cl. 355-3.0TR.
Mosbach, Erwin H.; McSherry, Charles K.; and Hylemon, Phillip B. Controlling micro-organisms. 4,371,528, Cl. 424-241.000.
Moser, Gottfried; and Gross, Hansjurgen, to Klockner-Humboldt-Deutz AG. Arrangement for heating the oil contained within an oil reservoir of a machine or of an internal combustion engine of a motor vehicle. 4,370,956, Cl. 123-196.0AB.
Moser, Robert; and Jungblut, Gottfried, to Swiss Aluminium Ltd. Device and process for operating an open baking furnace for manufacturing carbon-bearing, shaped bodies. 4,371,333, Cl. 432-3.000.
Mosto, James R.: *See*—
Chicklis, Evan P.; and Mosto, James R., 4,371,969, Cl. 372-77.000.
Motor Wheel Corporation: *See*—
Strader, Don S., 4,371,214, Cl. 301-126.000.
Motorola, Inc.: *See*—
Guzik, Andrzej T., 4,371,912, Cl. 361-417.000.
Hilbert, Francis H., 4,371,747, Cl. 179-1.0GS.
Medernach, John W.; Novak, Ivan A.; and Bush, Harry D., 4,371,598, Cl. 430-22.000.
Nash, Johnny R., 4,371,876, Cl. 343-768.000.
Moulthrop, Lawrence C.: *See*—
Balko, Edward N.; and Moulthrop, Lawrence C., 4,371,433, Cl. 204-228.000.
Moulton, Clifford H., to Palmguard, Inc. Method for analyzing stored image details. 4,371,865, Cl. 340-146.3MA.
Moyer, James D.; and Hoffert, Robert S., to Midwestco, Inc. Fabric tube forming methods and apparatus. 4,370,936, Cl. 112-10.000.
Muecke, Siegfried: *See*—
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, 4,371,831, Cl. 323-284.000.
Muehlberger, Erich, to Electro-Plasma, Inc. Fine particle filter system having low pressure drop for gaseous flow systems. 4,371,563, Cl. 427-34.000.
Mueller, Dieter: *See*—
Kerk, Klaus; Mueller, Dieter; and Oleiko, Bernd, 4,371,575, Cl. 428-81.000.

Muhlbauer, Gerhard; and Holler, Herbert, to Voest-Alpine Aktiengesellschaft. Adjustable carrying-tower arrangement for metallurgical vessels. 4,371,100, Cl. 222-591.000.

Mukai, Hideo: *See*—
Uchida, Kohachi; Nakatomi, Yoshitsugu; Takano, Toshimasa; and Mukai, Hideo, 4,371,252, Cl. 355-3.0CH.

Mulcahy, Harry W., to AMSTED Industries Incorporated. Railway car truck bolster assembly. 4,370,933, Cl. 105-197.0DB.

Mulder, Cornelis; Nederlof, Leendert; Niessen, Cornelis; Wijnhoven, Rene M. G.; and Salters, Roelof H. W., to U.S. Philips Corporation. Dynamic MOS-logic integrated circuit comprising a separate arrangement of combinatory and sequential logic elements. 4,371,795, Cl. 307-440.000.

Muller, Alfred; Schwab, Manfred; and Stroh, Walter, to Robert Bosch GmbH. Method and apparatus for controlling the torque of an internal combustion engine. 4,370,904, Cl. 74-858.000.

Muller, Jean-Marie A.: *See*—
Boyer, Gerard A. M.; Duvdevani, Ilan; and Muller, Jean-Marie A., 4,371,641, Cl. 524-70.000.

Muller, Karl-Hans; and Barthel, Walter, to Degussa Aktiengesellschaft. Mastic asphalt composition. 4,371,400, Cl. 106-273.00R.

Muller, Michael, to Apple Computer, Inc. Keyboard switch having combined actuator and jumper contact structure. 4,371,760, Cl. 200-5.00A.

Muller, Rolf, to Papst-Motoren KG. Brushless, permanent magnet d-c pulse current controlled, essentially uniform torque dynamo electric machine, particularly motor. 4,371,817, Cl. 318-254.000.

Mullersman, Ferdinand H.; and Scholefield, Clifford L., to General Electric Company. Battery charger with indicator for indicating full charge of secondary cells or battery thereof. 4,371,827, Cl. 320-48.000.

Multifastener Corporation: *See*—
Bien, Alfred A.; and Heidt, Frederick W., 4,370,794, Cl. 29-509.000.

Muma, William T., Jr.: *See*—
Morrison, Donald; and Muma, William T., Jr., 4,371,580, Cl. 428-250.000.

Mundus, Friedhelm, to Windmoller & Holscher. Apparatus for applying transverse weld or weld-severing seams to a web of thermoplastic or hot-sealable material. 4,371,413, Cl. 156-349.000.

Munn, Fred O. Universal latch-lock assembly. 4,370,874, Cl. 70-204.000.

Munro, Donald C. Universal beam clamp. 4,371,203, Cl. 294-86.00R.

Munro, James A., to Sperry Corporation. Agricultural balers. 4,370,924, Cl. 100-189.000.

Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, to Sterling Drug Inc. 2-Benzylideneglutaraldehydes useful as disinfectants. 4,371,547, Cl. 424-333.000.

Mura, Alojzy: *See*—
Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, 4,371,477, Cl. 261-30.000.

Muraki, Masayoshi: *See*—
Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, 4,371,726, Cl. 585-3.000.

Murakoshi, Makoto: *See*—
Oosaka, Shigenori; and Murakoshi, Makoto, 4,371,239, Cl. 353-26.00R.

Muranaka, Shigeo; Sugihara, Kunihiko; and Takeuchi, Kiyoshi, to Nissan Motor Company, Limited. Spark ignition timing control system for an internal combustion engine. 4,370,964, Cl. 123-425.000.

Murao, Yoshio. Clearer device provided above draft rolls. 4,370,781, Cl. 19-245.000.

Murata, Moriyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing electrode supporting base plate for radiation detector. 4,371,492, Cl. 264-226.000.

Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, to Hitachi, Ltd. Hermetic motor compressor. 4,371,319, Cl. 417-312.000.

Murfitt, Donald: *See*—
Wang, James C.; Murfitt, Donald; Livingston, Paul H.; and Joson, Luis K., 4,371,194, Cl. 281-21.00R.
Wang, James C.; Murfitt, Donald; and Livingston, Paul H., 4,371,195, Cl. 281-21.00R.

Murphy Door Bed Company, Inc.: *See*—
Teague, W. Dorwin, Jr., 4,370,766, Cl. 5-133.000.

Murphy, John J.; Petro, John; and Unglert, Melvin C., to Westinghouse Electric Corp. Single turret machine for fabricating high-intensity discharge arc tubes. 4,371,224, Cl. 316-32.000.

Muszynski, Larry C., to Shell Oil Company. Polyester polymer concrete compositions. 4,371,639, Cl. 523-512.000.

Muta, Natsuo; and Kanamaru, Toshihisa, to Saibu Gas Co. Ltd.; and Kabushiki Kaisha Kankyo Kaihatsu. Method for reinforcing and repairing piping. 4,371,569, Cl. 427-230.000.

Muth, Myron C.: *See*—
Schilke, Peter W.; Muth, Myron C.; Schilling, William F.; and Rairden, John R., III, 4,370,789, Cl. 29-156.80H.

Mylonakis, Stamatios G.; and Tortorello, Anthony J., to DeSoto, Inc. Polymers having improved water resistance and monomers for same. 4,371,669, Cl. 526-311.000.

Nabisco Brands, Inc.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., 4,371,549, Cl. 426-3.000.

Naf, Ferdinand; Decorzant, Rene; and Schulte-Elte, Karl H., to Firmenich SA. Bicyclic compounds and utilization thereof as perfuming agents. 4,371,460, Cl. 252-522.00R.

Nagashima, Yoshiaki; Kimura, Yoshiomi; and Hashimoto, Naoki, to Kirin Beer Kabushiki Kaisha. Process for brewing beer. 4,371,550, Cl. 426-16.000.

Nagata, Koji; Nishikawa, Mamoru; and Sato, Shiro, to Sumitomo Light Metal Ind., Ltd. Apparatus for coating the inner surface of long tubes of small diameter. 4,370,944, Cl. 118-302.000.

Nagata, Shuji: *See*—
Suzuki, Yasuo; Nagata, Shuji; and Yasuda, Kazumi, 4,370,910, Cl. 83-876.000.

Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, to Daiichi Radioisotope Laboratories, Ltd. Radioimmunoassay of pterins and novel pterin derivatives useful therefor. 4,371,514, Cl. 424-1.000.

Naik, Kirit: *See*—
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, 4,371,754, Cl. 179-18.0EE.

Nakagaki, Noboru; and Fujikawa, Hroaki, to Takeda Lace Co. Ltd. Warp knitted narrow lace and process for preparation thereof. 4,370,871, Cl. 66-202.000.

Nakagawa, Hiroshi: *See*—
Misawa, Yoshihiko; Kabeshita, Akira; Mori, Kazuhiro; Nakagawa, Hiroshi; and Araki, Shigeru, deceased, 4,370,804, Cl. 29-741.000.

Nakagawa, Yukio: *See*—
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Nakahara, Yutaka: *See*—
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Minagawa, Motonobu; Nakahara, Yutaka; and Tobita, Etsuo, 4,371,647, Cl. 524-120.000.

Nakaido, Shigehiro: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,371,597, Cl. 429-153.000.

Nakamura, Hiroya, to Konishiroku Photo Industry Co., Ltd. Composite information recording apparatus. 4,371,898, Cl. 358-300.000.

Nakamura, Norihiko; and Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,371,479, Cl. 261-44.00C.

Nakamura, Seiji: *See*—
Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, 4,371,440, Cl. 210-601.000.

Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Sano, Akira; Nakamura, Toru; Matsuura, Kazuo; and Miyoshi, Mituji, 4,371,679, Cl. 526-116.000.

Nakanishi Dental Mfg. Co. Ltd.: *See*—
Nakanishi, Takasuke, 4,371,341, Cl. 433-118.000.

Nakanishi, Ichiro: *See*—
Sugiyama, Masatoshi; Nakanishi, Ichiro; Ogawa, Akira; and Makekawa, Masakazu, 4,371,582, Cl. 428-341.000.

Nakanishi, Takasuke, to Nakanishi Dental Mfg. Co. Ltd. Dental handpiece. 4,371,341, Cl. 433-118.000.

Nakano, Yoshimasa: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,371,524, Cl. 424-180.000.

Nakano, Yoshio: *See*—
Foglia, Thomas A.; Perlstein, Theodore; Nakano, Yoshio; and Maerker, Gerhard, 4,371,469, Cl. 260-405.600.

Nakao, Yasutaka. Apparatus for conveying and closely gathering food. 4,371,076, Cl. 198-420.000.

Nakashima, Shozaburo: *See*—
Harase, Jiro; Takashima, Kunihide; and Nakashima, Shozaburo, 4,371,405, Cl. 148-111.000.

Nakatomi, Takayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronically controlled, fuel injection method. 4,370,968, Cl. 123-488.000.

Nakatomi, Yoshitsugu: *See*—
Uchida, Kohachi; Nakatomi, Yoshitsugu; Takano, Toshimasa; and Mukai, Hideo, 4,371,252, Cl. 355-3.0CH.

Nakayama, Susumu: *See*—
Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, 4,371,319, Cl. 417-312.000.

Nanne, Johannes M.; and Post, Martin F. M., to Shell Oil Company. Process for the preparation of aromatic hydrocarbons using crystalline silicates as catalyst. 4,371,628, Cl. 518-713.000.

Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,371,822, Cl. 318-696.000.

Narisada, Masayuki; and Okada, Tetsuo, to Shionogi & Co., Ltd. Malonamidooxadethiacephem compounds. 4,371,532, Cl. 424-248.510.

Narozny, Ronald S., to Thomas & Betts Corporation. Electrical connector for terminating flat multiconductor cable. 4,371,225, Cl. 339-97.00C.

Narukawa, Satoshi: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,371,597, Cl. 429-153.000.

Nash, Johnny R., to Motorola Inc. Slot array antenna having a complex impedance termination and method of fabrication. 4,371,876, Cl. 343-768.000.

Nassl, Peter: *See*—
Dietrich, Karl-Heinz; Gruber, Josef; Rauffer, Walter; and Nassl, Peter, 4,371,242, Cl. 353-101.000.

National Research Development Corporation: *See—*
Palmer, John H. W.; and MacDonald, Alexander J. R., 4,371,345, Cl. 434-368.000.
National Semiconductor Corporation: *See—*
Dobkin, Robert C., 4,371,792, Cl. 307-255.000.
National Tax Administration Agency: *See—*
Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, 4,371,440, Cl. 210-601.000.
Nauerth, Karl-Heinz: *See—*
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Naylor, Carter G.: *See—*
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Nazarenko, Nicholas, to Du Pont de Nemours, E. I., and Company. Flexible screen-printable conductor composition. 4,371,459, Cl. 252-514.000.
NCR Corporation: *See—*
Edwards, Gordon L., Jr.; and Smith, Walter A., 4,371,963, Cl. 371-50.000.
Schuck, David B., 4,371,952, Cl. 364-900.000.
NDM Corporation: *See—*
Cartmell, James V., 4,370,984, Cl. 128-640.000.
Nederlof, Leendert: *See—*
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Neef, Gunter: *See—*
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Nelson, Dayle A. S.: *See—*
Oppy, Maureen A.; and Nelson, Dayle A. S., 4,371,557, Cl. 426-321.000.
Nelson, Wayne F., to A. Schulman, Inc. Modified ionomer blend and laminated article. 4,371,583, Cl. 428-358.000.
Neumann, Rainer: *See—*
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, 4,371,691, Cl. 528-196.000.
Newart Electronic Sciences, Inc.: *See—*
Hilligoss, William R., Jr.; and Hilligoss, Lawrence O., 4,371,751, Cl. 179-5.00R.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Mold release agents containing oxidation stable polyoxyalkylenes. 4,371,476, Cl. 260-709.000.
Nguyen-Dinh, Xuan: *See—*
Duhl, David N.; and Nguyen-Dinh, Xuan, 4,371,404, Cl. 148-3.000.
Nguyen Mong, Lan: *See—*
Bentzen, Craig L.; Nguyen Mong, Lan; and Niesor, Eric, 4,371,527, Cl. 424-204.000.
NHK Spring Co., Ltd.: *See—*
Ojima, Juji; and Yamamuro, Koichi, 4,371,360, Cl. 474-111.000.
Nicholson, Harold L., to Atlantic Richfield Company. Semi-continuous process for making star-block copolymers. 4,371,661, Cl. 525-53.000.
Nicholson, Margie M., to Rockwell International Corporation. Electrochromic display using rare-earth diphthalocyanines and a low freezing-point electrolyte. 4,371,236, Cl. 350-357.000.
Nickel, Bernd; and Schorr, Wolfgang, to Siemens Aktiengesellschaft. Device for measuring the location, attitude and/or change of location or, respectively attitude of a rigid body in space utilizing two sets of four parallel antennas for concentrating the field lines. 4,371,836, Cl. 324-207.000.
Nickel, Hans: *See—*
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.
Nickum, James D.: *See—*
King, Dennis D.; Breitwisch, Ronald L.; and Nickum, James D., 4,371,981, Cl. 455-219.000.
Niederdellmann, Georg: *See—*
Quiring, Bernd; Niederdellmann, Georg; Goyert, Wilhelm; and Wagner, Hans, 4,371,684, Cl. 528-65.000.
Nieh, Edward C. Y., to Texaco Inc. Vanadium-cobalt corrosion inhibitor system for sour gas conditioning solutions. 4,371,450, Cl. 252-189.000.
Niehenke, Edward C.; Klein, Gerald I.; and Linsenbardt, Aldo E., to Westinghouse Electric Corp. Receiver protector with multi-level STC attenuation. 4,371,851, Cl. 333-17.00L.
Nielsen, Mogens C.: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.
Niemanns, Gerd, to Draftex Development A.G. Sealing arrangements in the form of strips. 4,370,833, Cl. 49-489.000.
Niesor, Eric: *See—*
Bentzen, Craig L.; Nguyen Mong, Lan; and Niesor, Eric, 4,371,527, Cl. 424-204.000.
Niessen, Cornelis: *See—*
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Nifco Inc.: *See—*
Watanabe, Koji, 4,371,123, Cl. 242-71.800.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See—*
Ohashi, Shigeo; and Suga, Hiroyuki, 4,371,767, Cl. 200-335.000.
Nii, Yoshiji: *See—*
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Nimry, Tayseer S.: *See—*
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Nippon Chemical Industrial Co., Ltd.: *See—*
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, 4,371,656, Cl. 524-443.000.
Nippon Electric Co., Ltd.: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yokoyama, Kenji, 4,371,840, Cl. 330-10.000.
Nippon Kogaku K.K.: *See—*
Daitoku, Koichi; Sekine, Kenji; Matsukawa, Nobuo; and Sugimori, Shiro, 4,371,244, Cl. 354-173.000.
Nippon Oil Company, Ltd.: *See—*
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Nippon Soken, Inc.: *See—*
Kago, Yoshiyuki; Akita, Sigeyuki; and Fujikawa, Katsuhisa, 4,371,835, Cl. 324-174.000.
Shimogawa, Toshiaki; Ando, Takayuki; and Kuwakado, Satosi, 4,371,127, Cl. 242-107.200.
Nippon Steel Chemical Co., Ltd.: *See—*
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Nippon Steel Corporation: *See—*
Harase, Jiro; Takashima, Kunihide; and Nakashima, Shozaburo, 4,371,405, Cl. 148-111.000.
Suzuki, Yasuo; Nagata, Shuji; and Yasuda, Kazumi, 4,370,910, Cl. 83-876.000.
Nishi, Masataka: *See—*
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Nishikawa, Mamoru: *See—*
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Nishikawa, Masaji, to Olympus Optical Company Limited. Automatic controller of electrification of magnetic toner. 4,371,257, Cl. 355-14.00D.
Nishizawa, Junichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Dry etching apparatus. 4,371,412, Cl. 156-345.000.
Nissan Motor Company, Limited: *See—*
Fujioka, Kazuyoshi; and Ikkatai, Mitsuo, 4,371,066, Cl. 192-85.0AA.
Hosaka, Akio, 4,370,962, Cl. 123-416.000.
Ikeura, Kenji, 4,371,050, Cl. 180-271.000.
Kawasaki, Teruo; Nomura, Hiroyuki; and Takeuchi, Mikio, 4,371,864, Cl. 340-62.000.
Muranaka, Shigeo; Sugihara, Kunihiko; and Takeuchi, Kiyoshi, 4,370,964, Cl. 123-425.000.
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Yamaki, Kiyoshi; Mizote, Masanori; Takeda, Hitoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; Kawasaki, Teruo; and Mori, Kazuyuki, 4,371,940, Cl. 364-444.000.
Yamane, Ken, 4,371,219, Cl. 384-291.000.
Nissan Motor Co., Ltd., No. 2: *See—*
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Nissin Kogyo Kabushiki Kaisha: *See—*
Seki, Masayuki, 4,371,059, Cl. 188-71.800.
Noel, Stephane, to Solvay & Cie. Process for rapidly terminating the polymerization of vinyl chloride in aqueous suspension. 4,371,678, Cl. 526-83.000.
Nojiro, Kikuo: *See—*
Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, 4,371,440, Cl. 210-601.000.
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Vos, Geert H., 4,371,480, Cl. 261-87.000.
Nordson Corporation: *See—*
Scholl, Charles H.; and Frates, Paul S., 4,371,096, Cl. 222-190.000.
Northern Telecom Limited: *See—*
Debortoli, George; Meyerstein, Michael V.; and Velsher, Benne, 4,371,757, Cl. 179-98.000.
Northrop Corporation: *See—*
Cushman, Glenn F., 4,371,921, Cl. 364-138.000.
Norwood Minerals, Inc.: *See—*
Dick, Perry J., Jr., 4,371,376, Cl. 44-10.00R.
Nouvel, Jacques: *See—*
de Soyres, Bruno; and Nouvel, Jacques, 4,371,471, Cl. 260-438.50R.
Novak, Ivan A.: *See—*
Medernach, John W.; Novak, Ivan A.; and Bush, Harry D., 4,371,598, Cl. 430-22.000.
Novak, Peter: *See—*
Briner, Emil; and Novak, Peter, 4,370,850, Cl. 57-96.000.
Novo Industri A/S: *See—*
Posorske, Laurence H., 4,371,552, Cl. 426-50.000.

Nowotka, Paul G.: *See*—
von Schneidemesser, Christian; Nowotka, Paul G.; and Rudel, Gerhard, 4,370,835, Cl. 51-165.770.
Nozawa, Takamitsu; Kishi, Takao; and Hinokiyama, Minoru, to Yoshino Kogyosho Co., Ltd. Atomizer usable in both normal and inverted orientations. 4,371,098, Cl. 222-321.000.
NTN Toyo Bearing Co., Ltd.: *See*—
Saruta, Masahiro; and Uchiyama, Hiroki, 4,370,966, Cl. 123-447.000.
Numata, Katuhisa: *See*—
Hamada, Kaduto; Takata, Zitumi; and Numata, Katuhisa, 4,371,487, Cl. 264-49.000.
O. G. Hoyer A/S: *See*—
Degn, Kaj; and Waldstrom, Ejvind, 4,370,844, Cl. 53-546.000.
Oana, Yoshinori: *See*—
Kamiyama, Kiichi; and Oana, Yoshinori, 4,371,237, Cl. 351-245.000.
Obermayer, Bertram: *See*—
Skatsche, Othmar; Wagner, Johann; and Obermayer, Bertram, 4,370,957, Cl. 123-196.0AB.
Oberstrass, Detley, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting apparatus having adjustable friction discs. 4,370,851, Cl. 57-340.000.
Oberstrass, Detley; Hartig, Wolfgang; and Weber, Klaus, to Barmag Barmer Maschinenfabrik AG. Friction false twisting apparatus. 4,370,852, Cl. 57-340.000.
O'Brian, Edward D. Psychographs with sound producing members. 4,371,167, Cl. 273-161.000.
Odendaal, David F., to Gold Fields Mining and Development Limited. Underground rock chutes. 4,371,289, Cl. 405-150.000.
Oertle, Jakob: *See*—
Sedlacek, Franz; Oertle, Jakob; and Cebulla, Dietrich, 4,371,115, Cl. 239-524.000.
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., to Haggar Company. Transport system for automatic pocket implantation apparatus. 4,371,074, Cl. 198-339.000.
Ogarek, Bernard C.; and Heisterberg, Milton W., to GATX Tank Erection Corporation. Secondary seal for floating roof storage tank. 4,371,090, Cl. 220-224.000.
Ogata, Hisanao: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.
Ogawa, Akira: *See*—
Sugiyama, Masatoshi; Nakanishi, Ichiro; Ogawa, Akira; and Mackawa, Masakazu, 4,371,582, Cl. 428-341.000.
Ogawa, Masao: *See*—
Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, 4,371,411, Cl. 156-281.000.
Ogawa, Masaru: *See*—
Kikuchi, Toshiro; Ogawa, Masaru; and Ando, Makoto, 4,371,620, Cl. 435-189.000.
Ogden, Dennis H., to British Industrial Plastics Limited. Method of filling the cavity of a building block with an aminoplast resin foam involving reduced adhesion of the resin to the filling apparatus. 4,371,486, Cl. 264-46.600.
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Time detecting device for alarm clock. 4,371,267, Cl. 368-74.000.
Ogino, Takashi: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,371,531, Cl. 424-246.000.
Ogletree, Robert H., to Southwire Company. Technique for adding lead to steel. 4,371,395, Cl. 75-129.000.
Ohara, Tsunemasa; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Battery accommodating device. 4,371,594, Cl. 429-97.000.
Ohashi, Shigeo; and Suga, Hiroyuki, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Small-sized switch. 4,371,767, Cl. 200-335.000.
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, to Kanegafuchi Chemical Industry Co., Ltd. Process for preparation of optically active N-mercaptoalkanoylamino acids. 4,371,699, Cl. 548-201.000.
Ohata, Yasufumi: *See*—
Uchikawa, Fusaoki; Tanaka, Hideharu; Sekiya, Mutsuo; and Ohata, Yasufumi, 4,371,581, Cl. 428-304.400.
Ohbayashi, Keiji: *See*—
Kajiwara, Makoto; Miyamoto, Akihiko; Ohbayashi, Keiji; and Iwagaki, Masaru, 4,371,609, Cl. 430-373.000.
Ohkubo, Kiyokazu, to Honda Giken Kogyo Kabushiki Kaisha. Clutch operating device. 4,371,062, Cl. 192-3.610.
Ohno, Mitio: *See*—
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, 4,370,985, Cl. 128-663.000.
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, to Toyo Engineering Corporation. Process for hydrocarbon reforming and apparatus therefor. 4,371,452, Cl. 252-373.000.
Ojima, Juji; and Yamamuro, Koichi, to NHK Spring Co., Ltd. Locking mechanism in tension providing device. 4,371,360, Cl. 474-111.000.
Okabe, Moisei: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tatsumi, Hideo; and Tohkairin, Akira, 4,370,793, Cl. 29-446.000.
Okada, Tetsuo: *See*—
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Okamoto, Eiichi: *See*—
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Okamoto, Eiichi, 4,371,926, Cl. 364-200.000.
Okamura, Masatoshi; and Tanaka, Kimio, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,371,131, Cl. 242-199.000.
Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Co., Ltd. Tapping boss of magnetic tape cassette. 4,371,286, Cl. 403-407.000.
Okazaki, Seiji: *See*—
Yoshimoto, Takeshi; Hiraoka, Hideki; Okazaki, Seiji; Taniguchi, Yoshihiro; and Harada, Tsutomu, 4,371,260, Cl. 355-77.000.
Okazaki, Tethuharu; Komukai, Takeo; and Uchikuga, Saburo, to Sogo Pharmaceutical Co. Ltd. Process for preparing cysteamine-S-substituted compounds and derivatives thereof. 4,371,472, Cl. 260-453.08RY.
Oleiko, Bernd: *See*—
Kerk, Klaus; Mueller, Dieter; and Oleiko, Bernd, 4,371,575, Cl. 428-81.000.
Olsen, John H., to Flow Industries, Inc. Check valve assembly. 4,371,001, Cl. 137-512.300.
Olympus Optical Company Limited: *See*—
Nishikawa, Masaji, 4,371,257, Cl. 355-14.00D.
O'Neill, Charles R. Water-powered, rotary head shaver. 4,370,807, Cl. 30-41.500.
O'Neill, Richard K., to Diamond International Corporation. Liquid dispensing pump. 4,371,097, Cl. 222-321.000.
Ono, Mikiya: *See*—
Inukai, Takao; Fukuda, Yoshiaki; and Ono, Mikiya, 4,371,484, Cl. 264-44.000.
Ookawa, Kiyoshi: *See*—
Iwata, Toshio; and Ookawa, Kiyoshi, 4,370,963, Cl. 123-425.000.
Oosaka, Shigenori; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Film positioning device for microform printing system. 4,371,239, Cl. 353-26.00R.
Oppy, Maureen A.; and Nelson, Dayle A. S., to General Foods Corporation. Maintenance of protein quality in foods containing reducing sugars. 4,371,557, Cl. 426-321.000.
Opto-System AB: *See*—
Magner, Bengt, 4,371,281, Cl. 403-219.000.
Oreglio, Maurizio: *See*—
Zingrini, Carlo; and Oreglio, Maurizio, 4,371,083, Cl. 211-26.000.
Orthwein, William C. Anti-buckling device for mine-roof bolting machines. 4,371,040, Cl. 173-11.000.
Osborn, Richard W.: *See*—
Giles, Duane D.; and Osborn, Richard W., 4,371,328, Cl. 425-344.000.
Oshima, Takao: *See*—
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Ostbergs Fabriks AB: *See*—
Lindblom, Karl T., 4,371,017, Cl. 144-3.00D.
Otis Engineering Corporation: *See*—
Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., 4,371,038, Cl. 166-380.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Motor Co., Ltd. Control device for pulse motors, having a fail safe function. 4,371,822, Cl. 318-696.000.
Otsuka, Kazutoshi, to Toyo Kogyo Co., Ltd. Engine speed control system. 4,370,960, Cl. 123-339.000.
Otsuka, Kenichi: *See*—
Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, 4,371,440, Cl. 210-601.000.
Otsuka, Kozi: *See*—
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, 4,371,452, Cl. 252-373.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,371,524, Cl. 424-180.000.
Ott, Helmut, to Herion-Werke KG. Sealing arrangement, particularly for sealing valve piston relative to valve housing. 4,371,178, Cl. 277-154.000.
Otten, David: *See*—
Wilson, Gerald L.; and Otten, David, 4,371,832, Cl. 324-51.000.
Ottewell, Gerald A., to Lucas Industries Limited. Brake shoes for railway disc brakes. 4,371,061, Cl. 188-244.000.
Otvos, Laszlo: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Outboard Marine Corporation: *See*—
Blanchard, Clarence E., 4,371,348, Cl. 440-52.000.
Van de Walker, Peter G., 4,370,953, Cl. 123-55.0VS.
Owens-Illinois, Inc.: *See*—
Bower, Thomas E.; and Aust, John J., 4,371,366, Cl. 493-138.000.
Oxenreider, Terry R.; and Bush, Herbert A., Jr., to General Battery Corporation. Manifold vented battery cover. 4,371,591, Cl. 429-88.000.
Oy Wartsila AB: *See*—
Piiroinen, Paavo, 4,370,875, Cl. 70-422.000.
Oyama, Hiroshi: *See*—
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,370,764, Cl. 4-443.000.
P C U K Produits Chimiques Ugine Kuhlmann: *See*—
Alicot, Michel J. C.; and Tignol, Adrien P. N., 4,371,698, Cl. 548-177.000.

Paco Packaging Incorporated: *See*—
Haines, Russell R., 4,371,080, Cl. 206-531.000.
Page, Edward H.: *See*—
Scotti, Frank; and Page, Edward H., 4,371,451, Cl. 252-305.000.
Pako Corporation: *See*—
Kaufmann, Kenneth M., 4,371,819, Cl. 318-341.000.
Palmer, John H. W.; and MacDonald, Alexander J. R., to National Research Development Corporation. Multi-dimensional display equipment. 4,371,345, Cl. 434-368.000.
Palmguard, Inc.: *See*—
Moulton, Clifford H., 4,371,865, Cl. 340-146.3MA.
Palosi, Eva: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Palumbo, Pasquale M. Knee brace. 4,370,978, Cl. 128-80.00C.
Paly, Alexandr G.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
Panametrics, Inc.: *See*—
Pedersen, Norman E., 4,371,785, Cl. 250-343.000.
Panelgraphic Corporation: *See*—
Russell, Raymond J., 4,371,566, Cl. 427-53.100.
Pannell, Robert T. Material handling apparatus. 4,371,305, Cl. 414-300.000.
Paoletti, Ugo: *See*—
Benai, Tommaso; Leoncini, Novello; and Paoletti, Ugo, 4,371,491, Cl. 264-196.000.
Papineau, Ronald I., to Unique Energy Systems, Inc. Apparatus for generating hydrogen. 4,371,500, Cl. 422-115.000.
Pappalardo, Massimo: *See*—
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Papst, Georg: *See*—
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Papst-Motoren KG: *See*—
Muller, Rolf, 4,371,817, Cl. 318-254.000.
Papst-Motoren K.G.: *See*—
Burgbacher, Martin; Harmsen, Siegfried; and Papst, Georg, 4,371,313, Cl. 415-215.000.
Paraho Corporation: *See*—
Jones, John B., 4,371,335, Cl. 432-95.000.
Parfree, Colin S.; and Worthington, Peter, to International Standard Electric Corporation. Submarine optical cable. 4,371,234, Cl. 350-96.230.
Paris, Philippe Y. J.; and Couturier, Alain, to Le Materiel Telephonique Thomson-CSF. Process and systems for the electronic generation of wide-angle moving images for training in the navigation of ships. 4,371,343, Cl. 434-29.000.
Parker, Ellery: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Parker, Ellery; Hopkins, Walter; and Mackay, Donald A. M., 4,371,549, Cl. 426-3.000.
Parrella, Alfred T.: *See*—
Gordiski, Ronald J.; Bennett, Robert G., Jr.; Parrella, Alfred T.; and Bagnall, Michael, 4,371,941, Cl. 364-475.000.
Parrish, William J.; and Gates, James L., to Hughes Aircraft Company. Charge coupled device improved meander channel serial register. 4,371,885, Cl. 357-24.000.
Patent-Treuhand-Gesellschaft fuer elektrische Gluhlampen mbH: *See*—Geissler, Udo M., 4,371,811, Cl. 315-241.00P.
Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See*—Eckhardt, Frizt, 4,371,807, Cl. 313-318.000.
Patthy nee Lukats, Agnes: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Pautrot, Jean-Marc, to Rhone-Poulenc Industries. Process for the recovery of uranium contained in an impure phosphoric acid. 4,371,505, Cl. 423-10.000.
Pawelczyk, Jerzy: *See*—
Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, 4,371,477, Cl. 261-30.000.
Paxson, Timm E.; Kim, Leo; and Van Aken, Andre B., to Shell Oil Company. β-(Sec-alkoxy) ethanol process. 4,371,716, Cl. 568-678.000.
Peach, James M.: *See*—
Gregory, George K. E.; Peach, James M.; and Du Mayne, James D., 4,371,516, Cl. 424-22.000.
Pedersen, Norman E., to Panametrics, Inc. Method and apparatus for detection and analysis of fluids. 4,371,785, Cl. 250-343.000.
Pekerman, Gary M.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.
Peng, Yuchi P.; Huntzinger, Gerald O.; and Hallmann, Melvin H., to General Motors Corporation. Piezoelectric knock sensor. 4,371,804, Cl. 310-321.000.
Pennzoil Company: *See*—
Sardisco, John B.; and Drechsel, Erhart K., 4,371,512, Cl. 423-551.000.
Pepper, William, Jr., to Peptek, Incorporated. Edge terminations for impedance planes. 4,371,746, Cl. 178-18.000.
Peptek, Incorporated: *See*—
Pepper, William, Jr., 4,371,746, Cl. 178-18.000.
Perlstein, Theodore: *See*—
Foglia, Thomas A.; Perlstein, Theodore; Nakano, Yoshio; and Maerker, Gerhard, 4,371,469, Cl. 260-405.600.
Pernet, Andre G.: *See*—
Plattner, Jacob J.; Pernet, Andre G.; and Fung, Anthony K., 4,371,546, Cl. 424-330.000.
Pernosky, Richard J. Home heating system employing water heater as heating source. 4,371,111, Cl. 237-8.00R.
Perobelli, Aldo: *See*—
Pessina, Giorgio; and Perobelli, Aldo, 4,371,156, Cl. 270-54.000.
Perolls, Roland F.; and Steel, Norman R. Methods of and apparatus for closing bag mouths. 4,370,845, Cl. 53-572.000.
Persson, Gert A.: *See*—
Adolfsson, Rune; Persson, Gert A.; and Persson, Hans A. H., 4,370,880, Cl. 72-389.000.
Persson, Hans A. H.: *See*—
Adolfsson, Rune; Persson, Gert A.; and Persson, Hans A. H., 4,370,880, Cl. 72-389.000.
Pert, Candace B.; and Chang, Jaw-Kang, to United States of America, Health and Human Services. Enzyme-resistant opiate pentapeptides. 4,371,463, Cl. 260-112.50E.
Pertec Computer Corporation: *See*—
Brooke, Raymond, 4,371,904, Cl. 360-77.000.
Pessina, Giorgio; and Perobelli, Aldo. Centering conveyor, particularly for bookbindery and the like. 4,371,156, Cl. 270-54.000.
Peterpaul, Joseph, to Thomas & Betts Corporation. Die set having resilient workpiece retention means. 4,370,881, Cl. 72-402.000.
Peters, John W., to Hughes Aircraft Company. Low temperature process for depositing oxide layers by photochemical vapor deposition. 4,371,587, Cl. 428-446.000.
Peters, Klaus-Jurgen: *See*—
Gmelin, Karl; Stiefel, Peter; and Peters, Klaus-Jurgen, 4,370,967, Cl. 123-452.000.
Peters, Walter B., to Manville Service Corporation. Backing plate composition for brake shoes. 4,371,631, Cl. 523-153.000.
Peterson, Donald A., to Stoelting Co. Disposable stylus and reservoir. 4,371,880, Cl. 346-140.00R.
Petri, Heinz: *See*—
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Petrolite Corporation: *See*—
Clarke, Eugene L., 4,371,434, Cl. 204-302.000.
Forchielli, Americo L., 4,371,398, Cl. 106-10.000.
Quinlan, Patrick M., 4,371,497, Cl. 422-12.000.
Petrzelka, Miloslav; and Krude, Werner, to Uni-Cardan AG. Universal joint. 4,371,357, Cl. 464-128.000.
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Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.
Pfaff, Wayne K., to Plastronics Interconnections, Inc. Circuit package handling apparatus. 4,370,805, Cl. 29-741.000.
Pfizer Inc.: *See*—
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,371,720, Cl. 568-731.000.
Lombardino, Joseph G.; and Harbert, Charles A., 4,371,696, Cl. 546-283.000.
Phillips Petroleum Company: *See*—
Anderson, Kenneth L., 4,371,671, Cl. 528-388.000.
Bard, William B.; and Walters, John O., 4,371,499, Cl. 422-111.000.
Cheng, Paul J., 4,371,511, Cl. 423-456.000.
Clay, Roger D., 4,371,136, Cl. 248-49.000.
DiBiano, Robert J.; and Hobbs, James W., 4,371,426, Cl. 203-2.000.
Eastman, Alan D.; and Gardner, Lloyd E., 4,371,458, Cl. 252-439.000.
Eastman, Alan D., 4,371,730, Cl. 585-627.000.
Edmonds, James T., Jr.; and Scoggins, Lacey E., 4,371,706, Cl. 562-553.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., 4,371,507, Cl. 423-230.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., 4,371,728, Cl. 585-258.000.
Holler, Raymond E.; and Henson, Loyal E., 4,371,427, Cl. 203-3.000.
Hutson, Thomas, Jr., 4,371,718, Cl. 568-697.000.
Pollock, Lyle W., 4,371,481, Cl. 264-15.000.
Senatore, Guy, 4,371,635, Cl. 523-219.000.
Stewart, William S.; Funk, Gary L.; and Smith, Dexter E., 4,371,944, Cl. 364-502.000.
Van Pool, Joe, 4,371,732, Cl. 585-723.000.
Washer, Stone P., 4,371,731, Cl. 585-716.000.
Phipps, Arthur L.; and Stoyanov, Ben, to U.C. Industries. Method and apparatus for extruding foamed bodies involving the use of adjustable traction shaping rolls. 4,371,488, Cl. 264-51.000.

Phoenix Chemical Corporation: *See*—
Leistner, William E.; Minagawa, Motonobu; Tsuruga, Kouji; and Harada, Masashi, 4,371,651, Cl. 524-178.000.
Pi, Shing-Chou: *See*—
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Pickering, William; and Urbanc, David J., to Caterpillar Tractor Co. Dual element-single oscillator-ratio type digital transducer. 4,370,891, Cl. 73-861.030.
Piepenbrink, Ulrich: *See*—
Stein, Hermann; and Piepenbrink, Ulrich, 4,371,024, Cl. 152-158.000.
Piiroinen, Paavo, to Oy Wartsila AB. Slipping cylinder lock. 4,370,875, Cl. 70-422.000.
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Voegele, Jean D.; Jourdheuil, Pierre E. J.; Pizzol nee Dalmasso, Jeannine M.; and Pintureau, Bernard C. J., 4,370,946, Cl. 119-1.000.
Pipe Line Development Co., The: *See*—
Smith, William B., 4,370,995, Cl. 137-15.000.
Pischinger, Franz; and Havenith, Cornelis, to Pischinger, Franz. Method of operating an air-compressing, self-igniting engine for liquid fuel. 4,370,958, Cl. 123-276.000.
Pitchon, Esra; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., to General Foods Corporation. Soy-containing dog food. 4,371,556, Cl. 426-311.000.
Pitha, Josef, to United States of America, Health and Human Services. Water soluble forms of retinoids. 4,371,673, Cl. 525-426.000.
Pitney Bowes Inc.: *See*—
Weimer, Charles M., 4,371,781, Cl. 235-101.000.
Pitowski, Hans J.: *See*—
Mathes, Nikolaus; Pitowski, Hans J.; and Vitzthum, Gunther, 4,371,441, Cl. 210-649.000.
Pittman, Benny R. Inflatable umbrella and method of fabricating the same. 4,370,994, Cl. 135-20.00B.
Pitzalis, Octavius, Jr., to Hughes Aircraft Company. Modular microwave power divider-amplifier-combiner. 4,371,845, Cl. 330-277.000.
Piukovich, Sandor: *See*—
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.
Pizzol nee Dalmasso, Jeannine M.: *See*—
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Plage, Dieter: *See*—
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Plastronics Interconnections, Inc.: *See*—
Pfaff, Wayne K., 4,370,805, Cl. 29-741.000.
Platter, Sanford; and Shelley, Pierre, to Applied Magnetics Corporation. Method of making a thin film magnetic head assembly with multiconductive connecting elements. 4,370,802, Cl. 29-603.000.
Plattner, Jacob J.; Pernet, Andre G.; and Fung, Anthony K., to Abbott Laboratories. Benzophenone derivatives. 4,371,546, Cl. 424-330.000.
Pletcher, Erwin C. Orthodontic bracket. 4,371,337, Cl. 433-10.000.
Podell, Allen F.: *See*—
Sontheimer, Carl G.; and Podell, Allen F., 4,371,118, Cl. 241-30.000.
Podmaniczky, Andras; Tokes, Szabolcs; and Lenk, Attila M., to Magyar Tudomanyos Akademia Szamitastechnikai es Automatizalasi Kutato Intezete. Circuit arrangement for controlling a multi-beam acousto-optical cell in which Bragg diffraction is used for the generation of a plurality of outgoing laser beams. 4,371,964, Cl. 372-38.000.
Poehler, Theodore O., Jr.: *See*—
Potember, Richard S.; Poehler, Theodore O., Jr.; and Cowan, Dwaine O., 4,371,883, Cl. 357-8.000.
Polaroid Corporation: *See*—
Bartels-Keith, James R.; and Karger, Eva R., 4,371,603, Cl. 430-218.000.
Czumak, Frank M.; and Fichter, Peter K., 4,371,249, Cl. 354-304.000.
Erlichman, Irving, 4,371,075, Cl. 198-345.000.
Sulesky, Donald J., 4,371,248, Cl. 354-304.000.
Pollock, Lyle W., to Phillips Petroleum Company. Iron-containing refractory balls for retorting oil shale. 4,371,481, Cl. 264-15.000.
Pomfret, Colin T., to List, Hans. Liquid cooled multi-cylinder internal combustion engine. 4,370,951, Cl. 123-41.740.
Pommer, Ernst-Heinrich: *See*—
Acker, Rolf-Dieter; Koenig, Karl-Heinz; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,371,525, Cl. 424-184.000.
Popper Engineering Co., Ltd.: *See*—
Popper, Jakhin B., 4,370,888, Cl. 73-580.000.
Popper, Jakhin B., to Popper Engineering Co., Ltd. Vibratory weighing apparatus. 4,370,888, Cl. 73-580.000.
Porta Systems Corp.: *See*—
Fasano, Michael C., 4,371,756, Cl. 179-35.000.
Porter, Thomas M. Wire gate latch. 4,371,200, Cl. 292-99.000.
Posorske, Laurence H., to Novo Industri A/S. Prune juice production using cellulase. 4,371,552, Cl. 426-50.000.
Possati, Mario, to Finike Italiana Marposs S.p.A. Gauging head for checking linear dimensions of mechanical pieces. 4,370,812, Cl. 33-169.00R.
Post, Martin F. M.: *See*—
Nanne, Johannes M.; and Post, Martin F. M., 4,371,628, Cl. 518-713.000.
Potember, Richard S.; Poehler, Theodore O., Jr.; and Cowan, Dwaine O., to Johns Hopkins University, The. Current controlled bistable electrical organic thin film switching device. 4,371,883, Cl. 357-8.000.
Poth, Ulrich: *See*—
Moller, Dieter; and Poth, Ulrich, 4,371,667, Cl. 525-208.000.
Potocnik, Joze, to Kolektor p.c. Method for manufacturing unfinished parts for pressed material commutators. 4,370,799, Cl. 29-597.000.
Potts, Herbert M.: *See*—
Tanner, Donald M.; and Potts, Herbert M., 4,371,109, Cl. 229-28.00R.
Powers, Earl W.: *See*—
Wilcox, Raymond J.; and Powers, Earl W., 4,371,293, Cl. 405-259.000.
Porna, Laszlo, to Tetra Pak International AB. Arrangement for the sealing of thermoplastic-coated packing material. 4,371,768, Cl. 219-10.530.
PPG Industries, Inc.: *See*—
Fahey, Dennis M., 4,371,584, Cl. 428-392.000.
Farabaugh, Aloysius W., 4,371,482, Cl. 264-40.100.
Preston, Edward G.: *See*—
DeAlto, Michael E.; DiGiacomo, Joseph D.; Marritt, Clifford R.; and Preston, Edward G., 4,370,908, Cl. 83-348.000.
Dowding, John G.; and Preston, Edward G., 4,370,942, Cl. 118-40.000.
Principe, William L.; and Fowler, Jacky L. Air table. 4,371,309, Cl. 414-676.000.
Pringle, William L. Fluid cylinder assembly. 4,370,918, Cl. 92-163.000.
Printing Developments, Inc.: *See*—
Ballarini, John A.; and Hetland, Timothy A., 4,371,430, Cl. 204-32.00R.
Pro-Line, Inc.: *See*—
Zide, Robert, 4,370,759, Cl. 2-424.000.
Procter & Gamble Company, The: *See*—
Jones, Keith A.; and Walker, Harry S., Jr., 4,371,461, Cl. 252-547.000.
Products Research & Chemical Corporation: *See*—
Hutter, Charles G., III, 4,371,094, Cl. 222-1.000.
Progress-Elektrogerate Mauz & Pfeiffer GmbH & Co.: *See*—
Kullik, Gunter R. J., 4,370,776, Cl. 15-319.000.
Prohaska, Hans: *See*—
Bienert, Herbert; Hanselmann, Dieter; Kohler, Alfred; and Prohaska, Hans, 4,370,774, Cl. 15-250.200.
Projectus Industriprodukter AB: *See*—
Gustafsson, Berth U., 4,370,772, Cl. 15-97.00R.
Prussen, John; and Gossen, Paul. Structural joint. 4,371,279, Cl. 403-8.000.
Pulcrano, Frank C.: *See*—
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,371,303, Cl. 414-281.000.
Q Corporation: *See*—
Smith, E. Quimby, Jr., 4,371,788, Cl. 290-42.000.
Queveau, Gerard; and Cheron, Christian. Articulation for vehicle, especially an articulated bus. 4,371,186, Cl. 280-432.000.
Quinlan, Patrick M., to Petrolite Corporation. Inhibition of corrosion with thiazine quaternary ammonium salts of polyepihalophydrin. 4,371,497, Cl. 422-12.000.
Quiring, Bernd; Niederdellmann, Georg; Goyert, Wilhelm; and Wagner, Hans, to Bayer Aktiengesellschaft. Thermoplastic polyurethanes for processing in extruders and/or on calenders. 4,371,684, Cl. 528-65.000.
Rabeisen, Andre J. Video communication system allowing graphic additions to the images communicated. 4,371,893, Cl. 358-93.000.
Rabino, Villarosal A. Convertible firearm-airgun. 4,370,822, Cl. 42-1.00R.
Ragaller, Klaus, to BBC Brown, Boveri & Company, Ltd. Electrical switch for large currents. 4,371,765, Cl. 200-147.00R.
Rahtz, Dieter: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.
Raidel, John E. Heavy vehicle suspension assembly with free floating springs and axle stabilizing torque rod. 4,371,189, Cl. 280-682.000.
Rairden, John R., III: *See*—
Schilke, Peter W.; Muth, Myron C.; Schilling, William F.; and Rairden, John R., III, 4,370,789, Cl. 29-156.80H.
Raisin, Jean-Pierre: *See*—
Doyen, Joel; and Raisin, Jean-Pierre, 4,371,159, Cl. 271-228.000.
Raleigh, Edward: *See*—
Kushner, Gerald J.; and Raleigh, Edward, 4,371,199, Cl. 285-382.200.
Ramey, Carol. Pressure energized portable power source, and apparatus incorporating same. 4,371,593, Cl. 429-97.000.
Ranadive, Deepak K.: *See*—
Anagnostopoulos, Constantine N.; and Ranadive, Deepak K., 4,371,890, Cl. 357-59.000.
Ranken, Paul F.: *See*—
Zaiko, Edward J.; and Ranken, Paul F., 4,371,473, Cl. 260-465.00G.
Rapoport, Morris, to Du Pont de Nemours, E. I., and Company. Hydrocyanation of olefins. 4,371,474, Cl. 260-465.80R.
Ratanangsu, Karl S. Elevating boot. 4,370,817, Cl. 36-81.000.
Rauffer, Walter: *See*—
Dietrich, Karl-Heinz; Gruber, Josef; Rauffer, Walter; and Nasil, Peter, 4,371,242, Cl. 353-101.000.

Rausing, Hans A., to Tetra Pak International AB. Method for the manufacture of a printed, pre-creased packing material web provided with opening indication. 4,371,364, Cl. 493-7.000.

Ravarotto, Robert: *See—*
Coetsier, Paul; and Ravarotto, Robert, 4,370,883, Cl. 73-117.000.

Raytheon Company: *See—*
Gilliatt, Charles L., 4,371,770, Cl. 219-10.55D.

RCA Corporation: *See—*
Holmes, David D., 4,371,266, Cl. 358-167.000.
Keigler, John E., 4,371,135, Cl. 244-173.000.
Knight, Mark B., 4,371,793, Cl. 307-260.000.
McGuffin, William G., 4,371,959, Cl. 369-43.000.
Rose, Gerald D., 4,371,961, Cl. 369-126.000.
Shanley, Robert L., II; and Harwood, Leopold A., 4,371,896, Cl. 358-172.000.
Siryj, Bohdan W., 4,371,246, Cl. 354-299.000.
Staebler, David L., 4,371,738, Cl. 136-243.000.
Yost, Thomas D., 4,371,891, Cl. 358-31.000.

Read, Vernon. Apparatus for and method of drilling a hole into the ground. 4,371,046, Cl. 175-57.000.

Realex Corporation: *See—*
Foster, Donald D.; and Magers, Wallace F., 4,371,099, Cl. 222-321.000.

Recla, Eugene B.: *See—*
Eibeck, Richard E.; Robinson, Martin A.; Evans, Francis E.; and Recla, Eugene B., 4,371,707, Cl. 568-6.000.

Regimbal, Richard R.: *See—*
Becker, Floyd W.; and Regimbal, Richard R., 4,371,041, Cl. 173-28.000.

Reidenbach, Robert B., to Budd Company, The. Apparatus and methods to provide shoring during the manufacturing of a reefer container. 4,370,795, Cl. 29-559.000.

Reilly, David M., to Medrad, Inc. Method and apparatus for injecting and for controlling the pressure of fluid being injected into a catheter. 4,370,982, Cl. 604-98.000.

Rems-Werk Christian Foll und Sohne GmbH & Co.: *See—*
Wagner, Rudolf, 4,370,770, Cl. 10-96.00R.

Renner, Carl A., to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions containing N-hydroxyamide and N-hydroxyimide sulfonates. 4,371,605, Cl. 430-280.000.

Resnicow, Herbert. Aerial device. 4,370,824, Cl. 46-74.00D.

Resonant Technology Company: *See—*
Gurries, Raymond A., 4,370,906, Cl. 81-464.000.

Reuters Limited: *See—*
Adams, John H., 4,371,871, Cl. 340-717.000.

Reynolds, Blake: *See—*
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.

Rhone-Poulenc Industries: *See—*
Bernelin, Daniel; and Meyer, Jacques, 4,371,638, Cl. 523-427.000.
Chamard, Alex; Dougier, Patrick; and Monteil, Jean-Bruno, 4,371,567, Cl. 427-130.000.
de Soyres, Bruno; and Nouvel, Jacques, 4,371,471, Cl. 260-438.50R.
Pautrot, Jean-Marc, 4,371,505, Cl. 423-10.000.

Rhythm Watch Company Limited: *See—*
Miyasaka, Hiroshi; and Yamada, Shinji, 4,371,268, Cl. 368-82.000.

Rice, John E., Sr.: *See—*
Melzer, Zecharia; and Rice, John E., Sr., 4,370,940, Cl. 112-286.000.

Richart, Ralph M.: *See—*
Manning, John J.; Rosin, Robert E.; and Richart, Ralph M., 4,371,790, Cl. 307-118.000.

Richmond, Bonnie D. Garment with a modesty panel. 4,370,757, Cl. 2-400.000.

Richter, Eike, to General Electric Company. Method and apparatus for output regulation of multiple disk permanent magnet machines. 4,371,801, Cl. 310-156.000.

Richter Gedeon Vegyeszeti Gyar RT.: *See—*
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.

Richter, George N.: *See—*
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.

Ricoh Co., Ltd.: *See—*
Jinnai, Koichiro, 4,371,878, Cl. 346-75.000.
Satomi, Toyokazu, 4,371,255, Cl. 355-8.000.

Ridgway, Lance D., to Hy-Reel Machinery, Inc. Vehicle mountable cable reel apparatus. 4,371,147, Cl. 254-326.000.

Riedel, Walter: *See—*
Berstein, Garri; and Riedel, Walter, 4,371,296, Cl. 407-115.000.

Rieter Machine Works, Ltd.: *See—*
Briner, Emil; and Novak, Peter, 4,370,850, Cl. 57-96.000.

Riley, Terence J.: *See—*
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., 4,371,887, Cl. 357-38.000.

Ringham, Stanley A., to Adbar (Patent Co.) Limited. Insert. 4,371,300, Cl. 411-41.000.

Riordan, Edward D.: *See—*
Szantho, Charles F.; and Riordan, Edward D., 4,371,772, Cl. 219-89.000.

RMR Systems, Inc.: *See—*
Manning, John J.; Rosin, Robert E.; and Richart, Ralph M., 4,371,790, Cl. 307-118.000.

Roady, Daniel K.: *See—*
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,371,074, Cl. 198-339.000.

Robert Bosch GmbH: *See—*
Bube, Carsten; Dull, Ernst H.; Thiele, Gerd; and Zeller, Hans, 4,371,910, Cl. 361-106.000.
Frank, Dieter, 4,371,797, Cl. 307-577.000.
Gmelin, Karl; Stiefel, Peter; and Peters, Klaus-Jurgen, 4,370,967, Cl. 123-452.000.
Hohn, Richard; Jung, Werner; Winter, Gerhard; and Woerner, Siegfried, 4,371,879, Cl. 346-135.100.
Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,370,904, Cl. 74-858.000.
Sauer, Rudolf; and Romann, Peter, 4,370,887, Cl. 73-204.000.
Stroh, Walter; and Schwab, Manfred, 4,370,903, Cl. 74-858.000.
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Roberts, Herbert B. Device for mounting equipment in vehicles. 4,371,138, Cl. 248-201.000.

Roberts, William J., to Eltra Corporation. Speed switch. 4,371,833, Cl. 324-161.000.

Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Sulfur-modified polytetramethylene ether glycols, a method for preparing them, and polyurethanes prepared therefrom. 4,371,687, Cl. 528-79.000.

Robinson, Ivan M.: *See—*
Baxter, Warren N.; Merckling, Nicholas G., deceased; Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., 4,371,680, Cl. 526-159.000.

Robinson, Martin A.: *See—*
Eibeck, Richard E.; Robinson, Martin A.; Evans, Francis E.; and Recla, Eugene B., 4,371,707, Cl. 568-6.000.

Roble, Roy A.: *See—*
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.

Rockefeller University, The: *See—*
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Rockwell International Corporation: *See—*
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, 4,371,754, Cl. 179-18.0EE.
Dugan, John M., 4,371,974, Cl. 375-82.000.
Dugan, John M., 4,371,975, Cl. 375-120.000.
Hallford, Ben R., 4,371,982, Cl. 455-327.000.
King, Dennis D.; Breitwisch, Ronald L.; and Nickum, James D., 4,371,981, Cl. 455-219.000.
Nicholson, Margie M., 4,371,236, Cl. 350-357.000.
Schaefer, Marcus J.; and DeTar, George F., Jr., 4,371,924, Cl. 364-200.000.

Rodaway, Keith S., to Everest & Jennings, Inc. T-joint method and product. 4,370,790, Cl. 29-157.00T.

Rodgers, Aubrey, to United States of America, Army. Thin film plane-polarized intensity pickoff. 4,371,784, Cl. 250-231.0GY.

Rogers, Alfred N.: *See—*
Awerbuch, Leon; and Rogers, Alfred N., 4,370,858, Cl. 60-641.500.

Roggendorff, Stephen; and Walker, Cuthbert J. Methods of manufacturing large tubular columns. 4,371,108, Cl. 228-173.00C.

Rohm GmbH: *See—*
Kerk, Klaus; Mueller, Dieter; and Oleiko, Bernd, 4,371,575, Cl. 428-81.000.

Rohm and Haas Company: *See—*
Gleim, Robert D.; and Gray, Richard T., 4,371,393, Cl. 75-108.000.
Memon, Nazir A., 4,371,585, Cl. 428-412.000.

Rohr, Jakob, to George Fischer Aktiengesellschaft. Wheel rim bolt attachment. 4,371,212, Cl. 301-9.0DN.

Roland, David R.: *See—*
Frick, Richard H.; Hill, Randolph J.; and Roland, David R., 4,371,417, Cl. 156-495.000.

Rollband, Ernest J. Nutcracker. 4,370,922, Cl. 99-572.000.

Roller, Hanno; and Nauerth, Karl-Heinz, to Fritz Eichenauer GmbH and Co. KG. Continuous flow electric water heater. 4,371,777, Cl. 219-298.000.

Rolls Royce Limited: *See—*
Woodward, Clifford S., 4,371,132, Cl. 244-53.00B.

Romann, Peter: *See—*
Sauer, Rudolf; and Romann, Peter, 4,370,887, Cl. 73-204.000.

Roscamp, Thomas A.; and Gibson, George W., to Applied Magnetics Corporation. Method of making a thin film magnetic head assembly with multiconductive connecting elements. 4,370,801, Cl. 29-603.000.

Rose, David; Moller, Hinrich; and Maak, Norbert, to Henkel Kommanditgesellschaft auf Aktien. Oxidation hair dyes comprising bis-(2,4-diaminophenoxy)-alkanols as coupling components. 4,371,370, Cl. 8-408.000.

Rose, Gerald D., to RCA Corporation. Capacitive information system. 4,371,961, Cl. 369-126.000.

Rose, Leon L., to Caribbean Properties Limited. Process and apparatus for the contact and separation of immiscible fluids. 4,371,382, Cl. 55-92.000.

Rosemount Inc.: *See*—
Frick, Roger L., 4,370,890, Cl. 73-718.000.

Rosenquist, Niles R.; and Tyrell, John A., to General Electric Company. Flame retardant polycarbonates. 4,371,650, Cl. 524-162.000.

Rosenthal, Jakub: *See*—
Kadlec, Vlastimil; Grosser, Vojtech; and Rosenthal, Jakub, 4,371,456, Cl. 252-435.000.

Rosin, Robert E.: *See*—
Manning, John J.; Rosin, Robert E.; and Richart, Ralph M., 4,371,790, Cl. 307-118.000.

Ross, Woodrow M. Irrigation system. 4,371,113, Cl. 239-201.000.

Rossman, Walter A., to Singer Company, The. Fractional clock edge smoother for a real-time simulation of a polygon face object system. 4,371,872, Cl. 340-728.000.

Rost, K. Lennart. Radon removal system. 4,371,383, Cl. 55-169.000.

Rotork Controls Limited: *See*—
Fry, Jeremy J.; and Smith, Peter R., 4,370,902, Cl. 74-625.000.

Rovnyak, George C., to E. R. Squibb & Sons, Inc. Phosphinylalkanoyl substituted 4,5-dihydropyrazole-5-carboxylic acid derivatives and hypotensive method and composition. 4,371,526, Cl. 424-200.000.

Rovnyak, George C., to E. R. Squibb & Sons, Inc. Bis-amidine indene ketones, compositions containing same and method of use. 4,371,543, Cl. 424-319.000.

Rubin, Michael D., to Ford Aerospace & Communications Corporation. Differentially coherent signal detector. 4,371,839, Cl. 329-104.000.

Rubner, Roland: *See*—
Ahne, Hellmut; Kuhn, Eberhard; and Rubner, Roland, 4,371,685, Cl. 528-73.000.

Rudel, Gerhard: *See*—
von Schneidemesser, Christian; Nowotka, Paul G.; and Rudel, Gerhard, 4,370,835, Cl. 51-165.770.

Rueckerl, Alfred: *See*—
Bork, Klaus; and Rueckerl, Alfred, 4,371,881, Cl. 346-140.00R.

Ruggeri, John R. Rotary valve for an internal combustion engine. 4,370,955, Cl. 123-190.0BB.

Runion, Cleaston L., to Brown Stove Works, Inc. Ignition circuit deenergizing spring for gas appliance valve-switch. 4,371,764, Cl. 200-61.860.

Rupp, Richard H.: *See*—
Beck, Gerhard; Knolle, Jochen; Rupp, Richard H.; and Scholkens, Bernward, 4,371,542, Cl. 424-274.000.

Ruprecht, David R.: *See*—
Lovette, Norris G., Jr.; and Ruprecht, David R., 4,370,861, Cl. 62-63.000.

Ruscelli, Emilio: *See*—
Borca, Bruno; and Ruscelli, Emilio, 4,371,288, Cl. 405-53.000.

Rusnak, Jan: *See*—
Turza, Jozef; Kilik, Ondrej; and Rusnak, Jan, 4,371,217, Cl. 308-5.00R.

Russell, Raymond J., to Panelgraphic Corporation. Abrasion resistant coating composition. 4,371,566, Cl. 427-53.100.

Russell, Robert J., to Dow Chemical Company, The. Physically-ameliorated styrene polymer/thermoplastic elastomer polyblends. 4,371,663, Cl. 525-95.000.

Russell, William F.: *See*—
Monigold, Ray A.; and Russell, William F., 4,371,181, Cl. 280-5.00A.

Ruthrof, Klaus; and Meier, Rainer, to Kraftwerk Union Aktiengesellschaft. Test device for the detection and analysis of material faults. 4,370,889, Cl. 73-619.000.

Ruti Machinery Works Ltd.: *See*—
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Ryan, Charles P.: *See*—
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,371,927, Cl. 364-200.000.

Sacchi, Giulio. Semi-rotary hydraulic pump. 4,371,320, Cl. 417-461.000.

Sachdev, Harbans S.: *See*—
Baise, Arnold I.; Burns, John M.; and Sachdev, Harbans S., 4,371,565, Cl. 427-41.000.

Sachs, Bertram: *See*—
Diepers, Heinrich; and Sachs, Bertram, 4,371,805, Cl. 310-334.000.

Sacilor-Acieries et Laminoirs de Lorraine: *See*—
Michaux, Jacques M., 4,370,877, Cl. 72-222.000.

Sadana, Devendra K.: *See*—
Strathman, Michael D.; Sadana, Devendra K.; and True, Richard B., 4,371,774, Cl. 219-121.0EA.

Sagami Chemical Research Center: *See*—
Umemoto, Teruo, 4,371,710, Cl. 568-35.000.

Sage, David M.; and Sage, George E. Variable reactance alignment detector and control. 4,371,116, Cl. 239-720.000.

Sage, George E.: *See*—
Sage, David M.; and Sage, George E., 4,371,116, Cl. 239-720.000.

Saibu Gas Co. Ltd.: *See*—
Muta, Natsuo; and Kanamaru, Toshihisa, 4,371,569, Cl. 427-230.000.

Saint-Gobain Vitrage: *See*—
Dages, Daniel, 4,371,586, Cl. 428-437.000.
Siemens, Walter; Ulrich, Gunther; and Bartusel, Karl R., 4,371,103, Cl. 225-1.000.

Saito, Kenji; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing 4-hydroxycyclopentenones. 4,371,711, Cl. 568-310.000.

Saito, Seitoku: *See*—
Izumi, Toshiaki; Saito, Seitoku; Maruta, Fumio; and Kameya, Minoru, 4,371,590, Cl. 428-555.000.

Sakamoto, Masakatsu, to Hitachi, Ltd. Slurry conveyor system. 4,371,294, Cl. 406-109.000.

Sakashita, Masao, to Kabushiki Kaisha Kawai Gakki Seisakusho. Shielded wire. 4,371,745, Cl. 174-115.000.

Saloff, William S. Damped fluid displacement support system. 4,370,768, Cl. 5-450.000.

Salowe, Seymour; and Zinchuk, Thomas C., to Westinghouse Electric Corp. Capacitor unit with a discharge resistor switch. 4,371,829, Cl. 323-209.000.

Salters, Roelof H. W.: *See*—
Mulder, Cornelis; Nederlof, Leendert; Niessen, Cornelis; Wijnhoven, Rene M. G.; and Salters, Roelof H. W., 4,371,795, Cl. 307-440.000.

Salzmann, Theodor, to Siemens Aktiengesellschaft. Polyphase frequency converter with individually current-regulated outputs. 4,371,920, Cl. 363-160.000.

Sambucetti, Carlos J.: *See*—
Kendall, Arthur H.; Mitchell, Joseph W.; and Sambucetti, Carlos J., 4,371,273, Cl. 400-119.000.

Sanchez, Moises G.; and Laine, Norman R., to W. R. Grace & Co. Alumina compositions. 4,371,513, Cl. 423-625.000.

Sanders Associates, Inc.: *See*—
Chicklis, Evan P.; and Mosto, James R., 4,371,969, Cl. 372-77.000.

Sanderson, Brian A., to Smith & Nephew Associated Companies, Ltd. Protective devices and methods. 4,370,981, Cl. 128-334.00R.

Sandoz Ltd.: *See*—
Weible, Karl-Heinz, 4,371,372, Cl. 8-543.000.

Sandoz, Oscar A.; and Mar, John, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Antisubmarine warfare system. 4,371,957, Cl. 367-3.000.

Sankey, Edwin W.; and Whittingham, David J., to Dresser Industries, Inc. Support structures of excavating machines. 4,371,086, Cl. 212-253.000.

Sankyo Company Ltd.: *See*—
Soma, Nobuo; Moromura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,371,644, Cl. 524-102.000.

Sano, Akira: *See*—
Kuroda, Nobuyuki; Sano, Akira; Nakamura, Toru; Matsuura, Kazuo; and Miyoshi, Mituji, 4,371,679, Cl. 526-116.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Kimpara, Akiyoshi, 4,370,998, Cl. 137-264.000.

Sanyo Electric Co., Ltd.: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,371,597, Cl. 429-153.000.

Sardisco, John B.; and Drechsel, Erhart K., to Pennzoil Company. Production of alkali metal sulfates. 4,371,512, Cl. 423-551.000.

Sargent Industries, Inc.: *See*—
Smith, Fred T., 4,371,304, Cl. 414-293.000.
Smith, Fred T., 4,371,306, Cl. 414-325.000.

Sarkadi, Adam: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kinfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.

Saruta, Masahiro; and Uchiyama, Hiroki, to NTN Toyo Bearing Co., Ltd. Fuel feed system. 4,370,966, Cl. 123-447.000.

Sasabe, Toshiki: *See*—
Homma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.

Sasaki, Nobuo, to Fujitsu Limited. Charge-pumping MOS FET memory device. 4,371,955, Cl. 365-185.000.

Sasaki, Osamu: *See*—
Homma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,371,081, Cl. 209-580.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Photoelectric sorting device for color sorting apparatus. 4,371,081, Cl. 209-580.000.

Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, to Mitsubishi Burlington Co., Ltd.; Ajinomoto Co., Ltd.; and Mitsui & Co., Ltd. Antimicrobial carpet containing amino acid type surfactant. 4,371,577, Cl. 428-96.000.

Sato, Shiro: *See*—
Nagata, Koji; Nishikawa, Mamoru; and Sato, Shiro, 4,370,944, Cl. 118-302.000.

Satoh, Masatoshi: *See*—
Takahashi, Hiroshi; and Satoh, Masatoshi, 4,370,809, Cl. 30-381.000.

Satomi, Toyokazu, to Ricoh Company, Ltd. Electrophotographic copying method and apparatus of reciprocal original scanning type. 4,371,255, Cl. 355-8.000.

Sauer, Rudolf; and Romann, Peter, to Robert Bosch GmbH. Device for measuring the mass of a flowing medium. 4,370,887, Cl. 73-204.000.

Saujet, Claude, to Cartier International B.V. Package for perfume products. 4,371,087, Cl. 215-12.00R.

Sawyer, John: *See*—
Bolen, Ralph A., 4,370,901, Cl. 74-586.000.

Sax Zzyzx, Ltd.: *See*—
Anthony, Myron L., 4,371,424, Cl. 202-159.000.

Saxholm, Rolf. Apparatus and testing reactions. 4,371,624, Cl. 435-291.000.

Schaaf, Wayne J.; and Boswell, Bennie J., to Chromalloy American Corporation. Tool bar control for agricultural implement. 4,371,039, Cl. 172-244.000.

Schaefer, Hans; and Budich, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Sliding window. 4,370,830, Cl. 49-413.000.

Schaefer, Marcus J.; and DeTar, George F., Jr., to Rockwell International Corp. Computer system apparatus for prefetching data requested by a peripheral device from memory. 4,371,924, Cl. 364-200.000.

Schank, Richard L.; and Marsh, Dana G., to Xerox Corporation. Release overcoat for photoresponsive device. 4,371,600, Cl. 430-56.000.

Schara, Robert E.: *See—*
Pitchon, Esra; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., 4,371,556, Cl. 426-311.000.

Scharf, Emil: *See—*
Hertel, Otto; Scharf, Emil; Melzer, Jaroslav; and Fikentscher, Rolf, 4,371,674, Cl. 525-435.000.

Schebler, Andreas: *See—*
Meixner, Hans; and Schebler, Andreas, 4,371,778, Cl. 219-302.000.

Schedlitzki, Dietmar: *See—*
Fock, Jurgen; Schedlitzki, Dietmar; Holtschmidt, Ulrich; and Ahrens, Wilhelm, 4,371,683, Cl. 528-60.000.

Scheef, Hans-Volker: *See—*
Herwig, Jens; Schleppinghoff, Bernhard; and Scheef, Hans-Volker, 4,371,725, Cl. 568-907.000.

Scheffel, Walter. Picking method and apparatus on textile looms involving the use of a fluid medium. 4,371,007, Cl. 139-435.000.

Scherer, Hans; Lotsch, Wolfgang; and Bock, Gustav, to BASF Aktiengesellschaft. Preparation of pigments having improved technological properties. 4,371,735, Cl. 544-300.000.

Schering, Aktiengesellschaft: *See—*
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.

Scherling AG: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

Scheunemann, Kurt: *See—*
Lindner, Friedrich; and Scheunemann, Kurt, 4,371,029, Cl. 165-10.000.

Schiepers, Lambertus A. C.: *See—*
Boesten, Wilhelmus H. J.; and Schiepers, Lambertus A. C., 4,371,464, Cl. 260-112.50R.

Schierjott, Rudolf, to Siemens Aktiengesellschaft. High efficiency push-pull saturation converter. 4,371,918, Cl. 363-22.000.

Schiessl, Alois: *See—*
Steinicke, Wolfgang; Badura, Wolfgang; Schiessl, Alois; Weinzierl, Werner; and Krone, Hartmut, 4,370,929, Cl. 102-202.000.

Schilke, Peter W.; Muth, Myron C.; Schilling, William F.; and Rairden, John R., III. Fabrication of gas turbine water-cooled composite nozzle and bucket hardware employing plasma spray process. 4,370,789, Cl. 29-156.80H.

Schilling, Walter W.: *See—*
Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., 4,371,020, Cl. 144-366.000.

Schilling, William F.: *See—*
Schilke, Peter W.; Muth, Myron C.; Schilling, William F.; and Rairden, John R., III, 4,370,789, Cl. 29-156.80H.

Schindel, Arnold; and Caspar, John A., to Singer Company, The. Commutator brush holder quadrature spring. 4,371,803, Cl. 310-242.000.

Schippers, Heinz: *See—*
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,370,853, Cl. 57-340.000.

Schleppinghoff, Bernhard: *See—*
Herwig, Jens; Schleppinghoff, Bernhard; and Scheef, Hans-Volker, 4,371,725, Cl. 568-907.000.

Schluter, Wilhelm: *See—*
Beckschulte, Heinrich; and Schluter, Wilhelm, 4,370,945, Cl. 118-303.000.

Schmidt, Kurt: *See—*
Marx, Karl; Winkler, Klaus; Schmidt, Kurt; and Jentzsch, Joachim, 4,371,158, Cl. 271-103.000.

Schmidt, Peter-Jurgen: *See—*
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Schmidt, Sylvia, to Kleinewefers GmbH. Apparatus for leveling the surface of a strip of paper. 4,370,923, Cl. 100-47.000.

Schmiechen, Ralph: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

Schmitt, Frederick L.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,371,715, Cl. 568-659.000.

Schmitz, Andreas: *See—*
Fischer, Berthold; Kabelitz, Hans-Peter; and Schmitz, Andreas, 4,371,323, Cl. 418-55.000.

Schmoock, Roy F., to Fischer & Porter Co. Electromagnetic flowmeter having noise suppression network. 4,370,892, Cl. 73-861.120.

Schneider, Thomas E.: *See—*
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,370,806, Cl. 29-749.000.

Schnettler, Richard A.: *See—*
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,371,737, Cl. 544-370.000.

Scholefield, Clifford L.: *See—*
Mullersman, Ferdinand H.; and Scholefield, Clifford L., 4,371,827, Cl. 320-48.000.

Scholes, Addison B., to Ball Corporation. Method and apparatus for handling glassware. 4,371,387, Cl. 65-118.000.

Scholkens, Bernward: *See—*
Beck, Gerhard; Knolle, Jochen; Rupp, Richard H.; and Scholkens, Bernward, 4,371,542, Cl. 424-274.000.

Scholl, Charles H.; and Frates, Paul S., to Nordson Corporation. Control apparatus for pressurized gas/liquid systems. 4,371,096, Cl. 222-190.000.

Schoolar, Richard B.: *See—*
Jensen, James D.; and Schoolar, Richard B., 4,371,232, Cl. 350-1.400.

Schorr, Wolfgang: *See—*
Nickel, Bernd; and Schorr, Wolfgang, 4,371,836, Cl. 324-207.000.

Schou, Henning: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 4,371,536, Cl. 424-256.000.

Schreiber, Erich: *See—*
Woss, Gerhard; and Schreiber, Erich, 4,370,884, Cl. 73-117.300.

Schroeder, Donald R.: *See—*
Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., 4,371,078, Cl. 206-329.000.

Schuck, David B., to NCR Corporation. Diagnostic circuitry for isolating a faulty subsystem in a data processing system. 4,371,952, Cl. 364-900.000.

Schuck, Stephan: *See—*
Koblo, Jochen; and Schuck, Stephan, 4,371,321, Cl. 418-45.000.

Schuftan, Alice, executrix: *See—*
Schuftan, Paul M., deceased, 4,371,381, Cl. 55-27.000.

Schuftan, Paul M., deceased (by Schuftan, Alice, executrix), to Cryoplants Limited. Gas purification process. 4,371,381, Cl. 55-27.000.

Schuller, Marius C., to Fiberglas Canada, Inc. Method and apparatus for winding strand material and package. 4,371,122, Cl. 242-43.00R.

Schulte-Elte, Karl H.: *See—*
Naf, Ferdinand; Decorzant, Rene; and Schulte-Elte, Karl H., 4,371,460, Cl. 252-522.00R.

Schulz, David A., to Union Carbide Corporation. Bobbin for use in producing a mesophase pitch derived carbon yarn. 4,371,129, Cl. 242-118.700.

Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, to Stihl, Andreas. Portable motor chain saw. 4,370,810, Cl. 30-382.000.

Schutte, Dieter: *See—*
Aichelmann, Dietmar; Kannenberg, Karl; Schutte, Dieter; and Volling, Axel, 4,371,503, Cl. 422-307.000.

Schwab, Manfred: *See—*
Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,370,904, Cl. 74-858.000.
Stroh, Walter; and Schwab, Manfred, 4,370,903, Cl. 74-858.000.

Schwartz, Robert D.; and Keller, Frederick A., Jr., to Union Carbide Corporation. Acetic acid by fermentation. 4,371,619, Cl. 435-140.000.

Schwarz, Dieter; Misner, Ralf; and Glasbergen, Johannes W., to U.S. Philips Corporation. Adaptive delta modulator. 4,371,972, Cl. 375-30.000.

Schwarz, Hans-Helmut: *See—*
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, 4,371,691, Cl. 528-196.000.

Schwarz, Rudolf, to Staeubli Ltd. Reading and control device for a control machine. 4,371,006, Cl. 139-68.000.

Schwerdt, Paul: *See—*
Grossner, Horst; Kaminski, Detlef; and Schwerdt, Paul, 4,370,965, Cl. 123-426.000.

Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Heterostructure lasers with combination active strip and passive waveguide strip. 4,371,966, Cl. 372-45.000.

SCM Corporation: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,371,722, Cl. 568-828.000.

Scoggins, Lacey E.: *See—*
Edmonds, James T., Jr.; and Scoggins, Lacey E., 4,371,706, Cl. 562-553.000.

Scordato, Richard E.; and Varca, Robert J., to Medical Laboratory Automation, Inc. Coded cuvette for use in testing apparatus. 4,371,498, Cl. 422-102.000.

Scott, M. Walter: *See—*
Abdelrahman, Mona; Fuchs, Ralph W.; Holman, James O.; Johnson, Robert G.; and Scott, M. Walter, 4,371,861, Cl. 338-25.000.

Scotti, Frank; and Page, Edward H. Lecithin containing surface release compositions. 4,371,451, Cl. 252-305.000.

Sea-Land Industries, Inc.: *See—*
Van Iperen, Willem H. P., 4,371,298, Cl. 410-25.000.

SEB S.A.: *See—*
Sebillotte, Christian, 4,370,999, Cl. 137-270.000.

Sebag, Henri: *See*—
Vanlerberghe, Guy; Sebag, Henri; Zysman, Alexandre; and Dubief, Claude, 4,371,517, Cl. 424-70.000.

Sebillotte, Christian, to SEB S.A. Pressure limiting device with two pressure levels for a pressure cooker. 4,370,999, Cl. 137-270.000.

Sedlacek, Franz; Oertle, Jakob; and Cebulla, Dietrich, to Escher Wyss Limited. Ring-gap nozzle. 4,371,115, Cl. 239-524.000.

Sedlaczek, Janusz: *See*—
Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, 4,371,477, Cl. 261-30.000.

Seifert, Peter: *See*—
Konig, Klaus; Illger, Hans-Walter; Seifert, Peter; and Meyborg, Holger, 4,371,630, Cl. 521-173.000.

Seijo, Hideji: *See*—
Matsumoto, Kunio; Izumi, Rokuro; Seijo, Hideji; and Mizuguchi, Hiroyuki, 4,371,612, Cl. 435-44.000.

Seiko Koki Kabushiki Kaisha: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,371,267, Cl. 368-74.000.

Seki, Masayuki, to Nissin Kogyo Kabushiki Kaisha. Automatic adjusting device in a disc brake. 4,371,059, Cl. 188-71.800.

Seki, Yoichi: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,371,267, Cl. 368-74.000.

Sekine, Kenji: *See*—
Daitoku, Koichi; Sekine, Kenji; Matsukawa, Nobuo; and Sugimori, Shiro, 4,371,244, Cl. 354-173.000.

Sekiya, Makoto: *See*—
Kinoshita, Hirotsugu; Uemura, Hiroshi; and Sekiya, Makoto, 4,371,446, Cl. 252-51.50A.

Sekiya, Mutsuo: *See*—
Uchikawa, Fusaoki; Tanaka, Hideharu; Sekiya, Mutsuo; and Ohata, Yasufumi, 4,371,581, Cl. 428-304.400.

Selby, Thomas P., to Du Pont de Nemours, E. I., and Company. Herbicidal pyridinyloxy(pyrimidinyloxy)benzenes. 4,371,736, Cl. 544-316.000.

Semenov, Evgeny I.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Senatore, Guy, to Phillips Petroleum Company. Filled high vinyl polybutadiene thermosetting compositions containing a maleic anhydride-polybutadiene adduct. 4,371,635, Cl. 523-219.000.

Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,371,856, Cl. 335-202.000.

Serini, Volker: *See*—
Friedhofen, Gerhard; Serini, Volker; Neumann, Rainer; Freitag, Dieter; and Schwarz, Hans-Helmut, 4,371,691, Cl. 528-196.000.

Serri, Roberto. Articulated prosthesis for lower limb. 4,370,761, Cl. 3-26.000.

Seybold, Guenther, to BASF Aktiengesellschaft. Preparation of thiazole derivatives. 4,371,734, Cl. 544-300.000.

Shackle, Peter W.: *See*—
Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., 4,371,886, Cl. 357-38.000.
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., 4,371,887, Cl. 357-38.000.

Shaffer, Robert L.; and Heckman, Richard W. Bowler's wrist and finger control device. 4,371,163, Cl. 273-54.00B.

Shah, Prabodh L., to Honeywell Inc. Programmable signal equalizer. 4,371,901, Cl. 360-65.000.

Shanley, Robert L., II; and Harwood, Leopold A., to RCA Corporation. Stabilized video signal control loop. 4,371,896, Cl. 358-172.000.

Sharp, Richard S.: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,371,949, Cl. 364-900.000.

Shaw, Jerry: *See*—
Solitt, Samuel G.; and Shaw, Jerry, 4,371,077, Cl. 206-45.140.

Shefford, Roger A., to Koninklijke Emballage Industrie Van Leer B.V. Enclosure member substantially impermeable to the transmission of solvents and fuels. 4,371,574, Cl. 428-35.000.

Sheibley, Dean W., to United States of America, National Aeronautics and Space Administration. Advanced inorganic separators for alkaline batteries and method of making the same. 4,371,596, Cl. 429-144.000.

Shell Oil Company: *See*—
Muszynski, Larry C., 4,371,639, Cl. 523-512.000.
Nanne, Johannes M.; and Post, Martin F. M., 4,371,628, Cl. 518-713.000.
Paxson, Timm E.; Kim, Leo; and Van Aken, Andre B., 4,371,716, Cl. 568-678.000.

Shelley, Pierre: *See*—
Platter, Sanford; and Shelley, Pierre, 4,370,802, Cl. 29-603.000.

Shelly, Randolph D. W., to Sperry Corporation. Non-dissipative battery charge circuit. 4,371,826, Cl. 320-21.000.

Shelly, William A.: *See*—
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,371,927, Cl. 364-200.000.

Shenkman, Mikhail Y.: *See*—
Ivanov, Valentin A.; Khodosh, Vladimir A.; Shenkman, Mikhail Y.; Kirbatov, Vladimir L.; and Fishman, Iosif D., 4,371,290, Cl. 405-150.000.

Shiba, Haruo: *See*—
Okamura, Masatoshi; and Shiba, Haruo, 4,371,236, Cl. 403-407.000.

Shibata, Kunio: *See*—
Suzuki, Hiroshi; Shibata, Kunio; and Sugita, Kazuhiko, 4,371,216, Cl. 384-118.000.

Shikasho, Satoru, to International Telephone and Telegraph Corporation. Pressure booster system with low-flow shut-down control. 4,371,315, Cl. 417-5.000.

Shimamoto, Susumu: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,371,064, Cl. 192-6.00A.
Shimano, Keizo, 4,371,176, Cl. 277-56.000.

Shimano, Keizo, to Shimano Industrial Company Limited. Drive and brake device for a bicycle. 4,371,064, Cl. 192-6.00A.

Shimano, Keizo, to Shimano Industrial Company Limited. Sealing construction for rotating portions at a bicycle. 4,371,176, Cl. 277-56.000.

Shimazaki, Masami: *See*—
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, 4,371,699, Cl. 548-201.000.

Shimizu, Hirokazu: *See*—
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,371,967, Cl. 372-45.000.

Shimizu, Ichiro; Komine, Yoshio; and Masunaga, Makoto, to Canon Kabushiki Kaisha. Motion picture camera having an auto-focus adjusting device. 4,371,240, Cl. 352-140.000.

Shimizu, Katsuichi: *See*—
Yoshimura, Shigeru; and Shimizu, Katsuichi, 4,371,256, Cl. 355-14.0SH.

Shimizu, Kazuo, to Agency of Industrial Science and Technology. Method for the preparation of ethylbenzene. 4,371,729, Cl. 585-453.000.

Shimogawa, Toshiaki; Ando, Takayuki; and Kuwakado, Satosi, to Nippon Soken, Inc. Seat belt locking device. 4,371,127, Cl. 242-107.200.

Shimozato, Yasuyuki: *See*—
Ikeda, Hiroharu; and Shimozato, Yasuyuki, 4,371,668, Cl. 525-133.000.

Shin Nippon Koki Co., Ltd.: *See*—
Watanabe, Kazutomi; Iwasaki, Sokichi; and Baba, Nobuyuki, 4,370,943, Cl. 118-218.000.

Shingo, Hiromichi, to Toyo Shokuhinkikai Kabushiki Kaisha. Apparatus for fitting and stacking bags onto pins. 4,371,365, Cl. 493-25.000.

Shinichiro, No: *See*—
Kazumi, Ozawa; and Shinichiro, No, 4,370,925, Cl. 101-40.000.

Shinoda, Kazuo; Higashigawa, Keizo; and Shiozawa, Ken, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti surge float chamber assembly. 4,371,000, Cl. 137-434.000.

Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, to Otsuka Pharmaceutical Co., Ltd. Anticomplementary agents comprising soyasapogenol B compounds. 4,371,524, Cl. 424-180.000.

Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,371,267, Cl. 368-74.000.

Shinozaki, Satoshi: *See*—
Yoshizawa, Rokuro; and Shinozaki, Satoshi, 4,371,423, Cl. 156-653.000.

Shionogi & Co., Ltd.: *See*—
Narisada, Masayuki; and Okada, Tetsuo, 4,371,532, Cl. 424-248.510.
Tanaka, Kentaro; Tsuji, Naoki; Kondo, Eiji; and Kawamura, Yoshimi, 4,371,617, Cl. 435-119.000.

Shiozawa, Ken: *See*—
Shinoda, Kazuo; Higashigawa, Keizo; and Shiozawa, Ken, 4,371,000, Cl. 137-434.000.

Shooltz, Michael L. Exercise device for runners. 4,371,160, Cl. 272-96.000.

Showa Kagaku Kogyo Company, Ltd.: *See*—
Yanagisawa, Takao; and Tanaka, Meguru, 4,371,475, Cl. 260-512.00R.

Sibley, Clifton B.; and Bell, Robert P., to Ferrofluidics Corporation. Crystal growing furnace pulling head. 4,371,502, Cl. 422-249.000.

Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut; Kuhn, Eberhard; and Rubner, Roland, 4,371,685, Cl. 528-73.000.
Bintig, Werner; and Christgau, Hermann, 4,371,806, Cl. 313-101.000.
Bork, Klaus; and Rueckerl, Alfred, 4,371,681, Cl. 346-140.00R.
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, 4,371,831, Cl. 323-284.000.
Diepers, Heinrich; and Sacha, Bertram, 4,371,805, Cl. 310-334.000.
Dollheimer, Jurgen; and Knoll, Klaus, 4,371,813, Cl. 315-377.000.
Jaeger, Klaus, 4,371,274, Cl. 400-121.000.
Januschkowetz, Herbert; and Laub, Hans, 4,371,573, Cl. 427-438.000.
Jung, Albert, 4,371,231, Cl. 339-275.00R.
Meixner, Hans; and Schebler, Andreas, 4,371,778, Cl. 219-302.000.
Nickel, Bernd; and Schorr, Wolfgang, 4,371,836, Cl. 324-207.000.
Salzmann, Theodor, 4,371,920, Cl. 363-160.000.
Schierjott, Rudolf, 4,371,918, Cl. 363-22.000.
Zeitraeg, Rolf, 4,371,962, Cl. 370-100.000.

Siemens, Walter; Ulrich, Gunther; and Bartusel, Karl R., to Saint-Gobain Vitrage. Process and apparatus for breaking off marginal edge portions from a glass pane. 4,371,103, Cl. 225-1.000.

Sieverin, Walter J., to American Can Company. Temperature compensated input power and output offset circuits for a hall effect transducer. 4,371,837, Cl. 324-225.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Cavazza, Claudio, 4,371,618, Cl. 435-128.000.

Signorini, Aldo: *See*—
Canevari, Cesare; and Signorini, Aldo, 4,371,025, Cl. 152-352.00R.

Silent Running Corporation: *See*—
Hannas, James R., 4,371,814, Cl. 318-16.000.

Silverman, Gary S.; Zera, Robert D.; Kubiatowicz, James F.; and Claussen, Robert L., to Custom Concepts Incorporated. Self-contained game. 4,371,171, Cl. 273-357.000.

Simington, Jack F. Chain tooth locator. 4,370,905, Cl. 76-74.000.

Simoglou, Arthur. Protective footwear. 4,370,818, Cl. 36-100.000.

Simonds, Gary: *See*—
Stewart, William R.; and Simonds, Gary, 4,370,972, Cl. 124-23.00R.

Simons, Peter B., to TBS, Inc. Toner loading system having cartridge with displaceable diaphragm. 4,371,015, Cl. 141-352.000.

Simson, Dionizy, to Sulzer Brothers Limited. Weft yarn accumulator. 4,371,009, Cl. 139-452.000.

Singer Company, The: *See*—
Rossman, Walter A., 4,371,872, Cl. 340-728.000.
Schindel, Arnold; and Caspar, John A., 4,371,803, Cl. 310-242.000.

Siregar, John A.; and Arkoudilos, John, to Liggett Group Inc. Semi-moist dog food preparation. 4,371,558, Cl. 426-332.000.

Siryj, Bohdan W., to RCA Corporation. Thermal processor. 4,371,246, Cl. 354-299.000.

Skalleberg, Oystein, to Skaltek AB. Arrangement in a cable winding machine. 4,371,308, Cl. 414-416.000.

Skaltek AB: *See*—
Skalleberg, Oystein, 4,371,308, Cl. 414-416.000.

Skatsche, Othmar; Wagner, Johann; and Obermayer, Bertram, to List, Hans. Assembly of auxiliary equipment for a water-cooled internal combustion engine. 4,370,957, Cl. 123-196.0AB.

Skogstrom, Lars: *See*—
Bernander, Karl-Gustav; and Skogstrom, Lars, 4,371,031, Cl. 165-54.000.

Skrzypiec, Zbigniew: *See*—
Karowiec, Krzysztof; Sedlaczek, Janusz; Mura, Alojzy; Pawelczyk, Jerzy; and Skrzypiec, Zbigniew, 4,371,477, Cl. 261-30.000.

Skytrends, Inc.: *See*—
George, Richard D.; and Vanhulle, Gary L., 4,371,204, Cl. 296-218.000.

Sliwka, Wolfgang: *See*—
Hoffman, Dietrich; and Sliwka, Wolfgang, 4,371,634, Cl. 523-208.000.

Smirnov, Jury V.: *See*—
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.

Smith, Dexter E.: *See*—
Stewart, William S.; Funk, Gary L.; and Smith, Dexter E., 4,371,944, Cl. 364-502.000.

Smith, Donald R.: *See*—
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.

Smith, E. Quimby, Jr., to Q Corporation. Energy device powered by the motion of water beneath waves. 4,371,788, Cl. 290-42.000.

Smith, Fred T., to Sargent Industries, Inc. Refuse compaction apparatus and method. 4,371,304, Cl. 414-293.000.

Smith, Fred T., to Sargent Industries, Inc. Refuse ejection apparatus. 4,371,306, Cl. 414-325.000.

Smith, Harry D., Jr.; and Dodge, Carl, to Halliburton Company. In situ measurement of gas content in formation fluid. 4,370,886, Cl. 73-153.000.

Smith International, Inc.: *See*—
Morrill, Charles D.; and Best, Michael J. A., 4,371,005, Cl. 138-89.000.
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,371,291, Cl. 405-169.000.

Smith, James L., to United States of America, Army. Real-time transformation of incoherent light images to edge-enhanced darkfield representation for cross-correlation applications. 4,371,866, Cl. 340-146.30F.

Smith & Nephew Associated Companies, Ltd.: *See*—
Sanderson, Brian A., 4,370,981, Cl. 128-334.00R.

Smith, Peter R.: *See*—
Fry, Jeremy J.; and Smith, Peter R., 4,370,902, Cl. 74-625.000.

Smith, Richard L., Jr., to SSC Industries, Inc. Product for delinting cottonseed. 4,371,449, Cl. 252-142.000.

Smith, Walter A.: *See*—
Edwards, Gordon L., Jr.; and Smith, Walter A., 4,371,963, Cl. 371-50.000.

Smith, William B., to Pipe Line Development Co., The. Method and apparatus for prenotching a pipeline. 4,370,995, Cl. 137-15.000.

Smrekar, Joseph J., to Milliken Research Corporation. Process for dyeing textile materials in solid shades. 4,371,371, Cl. 8-531.000.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Benai, Tommaso; Leoncini, Novello; and Paoletti, Ugo, 4,371,491, Cl. 264-196.000.

Snyder, Larry L., to Jarva, Inc. Tunnel boring machine and method of operating same. 4,371,211, Cl. 299-11.000.

Societa' Pneumatici Pirelli S.p.A.: *See*—
Canevari, Cesare; and Signorini, Aldo, 4,371,025, Cl. 152-352.00R.

Societe Anonyme Dite: Corneloup S.A.: *See*—
Arnaud, Claude B., 4,370,847, Cl. 56-330.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Marello, Georges; and Vernalle, Jean-Claude, 4,371,134, Cl. 244-173.000.

SODIP: *See*—
Benattar, Robert; and Cronenberger, Michel, 4,371,438, Cl. 210-232.000.

Sofue, Masahisa: *See*—
Murayama, Akira; Harada, Fumio; Arata, Tetsuya; Itagaki, Masato; Nakayama, Susumu; and Sofue, Masahisa, 4,371,319, Cl. 417-312.000.

Sogo Pharmaceutical Co. Ltd.: *See*—
Okazaki, Tethuharu; Komukai, Takeo; and Uchikuga, Saburo, 4,371,472, Cl. 260-453.0RY.

Soligno, Vincenzo. Tube support grid. 4,371,035, Cl. 165-162.000.

Solitt, Samuel G.; and Shaw, Jerry. Jewelry display device. 4,371,077, Cl. 206-45.140.

Solmat: *See*—
Assaf, Gad, 4,370,860, Cl. 60-641.110.

Soltysyk, Alex N. Coating composition for roads and other surfaces comprising chlorinated rubber, chlorinated paraffin and amorphous silica. 4,371,633, Cl. 523-172.000.

Solvay & Cie.: *See*—
Noel, Stephane, 4,371,678, Cl. 526-83.000.

Soma, Nobuo; Moromura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, to Sankyo Company Ltd. Piperidine derivatives and their use as polymer stabilizers. 4,371,644, Cl. 524-102.000.

Somerville, Ronald L.: *See*—
Anderson, David M.; Herrmann, Klaus M.; and Somerville, Ronald L., 4,371,614, Cl. 435-108.000.

Sone, Shigenori: *See*—
Mihara, Takao; Morichika, Toshiaki; and Sone, Shigenori, 4,371,775, Cl. 219-121.0PK.

Sonoco Products Company: *See*—
Case, Manson D., 4,371,130, Cl. 242-125.100.

Sontheimer, Carl G.; and Podell, Allen F., to Cuisinarts, Inc. Magnetic safety interlock method and apparatus for food processor. 4,371,118, Cl. 241-30.000.

Sorimachi, Mitsuo, to Hosiden Electronics Co., Ltd. Coil spring biased current limiter. 4,371,859, Cl. 337-365.000.

Southern Case, Inc.: *See*—
Dembicks, Andrew E., 4,371,079, Cl. 206-349.000.

Southwire Company: *See*—
Ogletree, Robert H., 4,371,395, Cl. 75-129.000.

Spangler, Paul J.; and Koslo, Robert C., to ETC, Incorporated. Integral electrical connector and method for making same. 4,371,229, Cl. 339-223.00R.

Spector, George: *See*—
Fermeglia, Gildo; and Spector, George, 4,371,284, Cl. 403-301.000.
Kroh, Norma J.; and Spector, George, 4,370,870, Cl. 66-1.00A.

Spectronics, Inc.: *See*—
Biard, James R.; and Elmer, Ben R., 4,371,847, Cl. 330-307.000.

Speed Systems, Inc.: *See*—
Maytham, Walter J., 4,370,808, Cl. 30-353.000.

Sperry Corporation: *See*—
Campbell, Willis R.; Freimuth, John H.; Diederich, Anthony F., Jr.; and Jennings, Richard E., 4,370,848, Cl. 56-341.000.
Gamble, Edward B., 4,371,846, Cl. 330-278.000.
Lee, Patrick S., 4,371,842, Cl. 330-141.000.
Munro, James A., 4,370,924, Cl. 100-189.000.
Shelly, Randolph D. W., 4,371,826, Cl. 320-21.000.

Spie-Batignolles: *See*—
Chabrier, Gilbert, 4,371,197, Cl. 285-47.000.

Spielau, Paul; Vohwinkel, Horst; and Kuhnel, Werner, to Dynamit Nobel Aktiengesellschaft. Molding compositions based on ester-compatible thermoplastic and/or elastomeric synthetic resins. 4,371,654, Cl. 524-296.000.

Sprecker, Mark A.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,371,715, Cl. 568-659.000.

Springhill Laboratories, Inc.: *See*—
Goldberg, Jerome; and Bloch, Christopher D., 4,371,191, Cl. 280-707.000.

SSC Industries, Inc.: *See*—
Smith, Richard L., Jr., 4,371,449, Cl. 252-142.000.

Staebler, David L., to RCA Corporation. Method of restoring degraded solar cells. 4,371,738, Cl. 136-243.000.

Staeubli Ltd.: *See*—
Schwarz, Rudolf, 4,371,006, Cl. 139-68.000.

Stahlhofen, Willi: *See*—
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; and Stahlhofen, Willi, 4,370,986, Cl. 128-716.000.

STAL-LAVAL Apparat AB: *See*—
Stendahl, Gunnar, 4,371,033, Cl. 165-104.160.

Stamatoff, Gelu S.: *See*—
Baxter, Warren N.; Merckling, Nicholas G., deceased; Masukawa, Noelle K., administratrix; Robinson, Ivan M.; and Stamatoff, Gelu S., 4,371,680, Cl. 526-159.000.

Stamicarbon, B.V.: *See*—
Boesten, Wilhelmus H. J.; and Schiepers, Lambertus A. C., 4,371,464, Cl. 260-112.50R.

Standard Oil Company: *See*—
Webb, Thomas H.; Vest, Hugh F.; and Chan, Keng S., 4,371,447, Cl. 252-73.000.

Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; and Nimry, Tayseer S., 4,371,701, Cl. 549-235.000.
Lee, Richard J.; and Baranowski, Leonard J., 4,371,712, Cl. 568-430.000.

Stanger, Bernd: *See*—
Druschke, Wolfgang; Kerckow, Albrecht; and Stanger, Bernd, 4,371,659, Cl. 524-599.000.

Stanley, Philip E.: *See*—
Barlow, George J.; Stanley, Philip E.; and Brown, Richard P., 4,371,928, Cl. 364-200.000.

Steel, Norman R.: *See*—
Perolls, Roland F.; and Steel, Norman R., 4,370,845, Cl. 53-572.000.

Steels, Gordon, to Baker Perkins Holdings Limited. Apparatus for making confectionery. 4,371,329, Cl. 425-437.000.

Steffen, Klaus-Dieter; and Thallmeier, Manfred, to Dynamit Nobel AG. Method of preparing oligomeric brominous xylylene bisphenol ethers. 4,371,709, Cl. 568-33.000.

Stein, Hermann; and Piepenbrink, Ulrich, to Vorwerk & Sohn GmbH & Co. KG. Emergency running ring for pneumatic vehicle tires. 4,371,024, Cl. 152-158.000.

Stein, Reinhardt P., to American Home Products Corporation. CNS Stimulants. 4,371,539, Cl. 424-272.000.

Stein, Reinhardt P., to American Home Products Corporation. 3-[1-(Hydroxymethyl)-2-phenylethyl]-N-[(phenylamino)-carbonyl]oxydnone imine. 4,371,697, Cl. 548-125.000.

Steinbeck, Hermann: *See*—
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.

Steinicke, Wolfgang; Badura, Wolfgang; Schiessl, Alois; Weinzierl, Werner; and Krone, Hartmut. Contact head. 4,370,929, Cl. 102-202.000.

Stendahl, Gunnar, to STAL-LAVAL Apparat AB. Gas-to-gas heat exchanger. 4,371,033, Cl. 165-104.160.

Sterling Drug Inc.: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,371,547, Cl. 424-333.000.

Stevens, Samuel B., to Caterpillar Tractor Co. Method for applying, stitching and severing a tape on a body. 4,371,410, Cl. 156-117.000.

Stevenson, David A., to United States of America, Navy. Method for controlling impurities in liquid phase epitaxial growth. 4,371,420, Cl. 156-624.000.

Stewart, William R.; and Simonds, Gary, to Victor United, Inc. Attachment member for securing the ends of cables in a compound bow. 4,370,972, Cl. 124-23.00R.

Stewart, William S.; Funk, Gary L.; and Smith, Dexter E., to Phillips Petroleum Company. Ethylene process control. 4,371,944, Cl. 364-502.000.

Stiefel, Peter: *See*—
Gmelin, Karl; Stiefel, Peter; and Peters, Klaus-Jurgen, 4,370,967, Cl. 123-452.000.

Stihl, Andreas: *See*—
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.

Stills, Melvin L.: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,370,977, Cl. 128-80.00F.

Stock, Arthur J.; and Christopher, Donald S., to Stock Equipment Company. Reversing ratchet door closer. 4,371,201, Cl. 292-251.000.

Stock Equipment Company: *See*—
Stock, Arthur J.; and Christopher, Donald S., 4,371,201, Cl. 292-251.000.

Stoelting Co.: *See*—
Peterson, Donald A., 4,371,880, Cl. 346-140.00R.

Stone, David S.: *See*—
Cohn, Seymour B.; Karp, Arthur; and Stone, David S., 4,371,854, Cl. 333-252.000.

Stoss, Peter, to Heinrich Mack Nachf. Chem-Parm. Fabrik. Process for the production of isosorbide-5-nitrate. 4,371,703, Cl. 549-464.000.

Stoyanov, Ben: *See*—
Phipps, Arthur L.; and Stoyanov, Ben, 4,371,488, Cl. 264-51.000.

Strader, Don S., to Motor Wheel Corporation. Bearing hub and carrier assembly for a driven steering wheel unit. 4,371,214, Cl. 301-126.000.

Strasser, Robert A.; and Goch, Stephen W., to Ford Motor Company. End cap for a propellant container. 4,370,930, Cl. 102-530.000.

Strathman, Michael D.; Sadana, Devendra K.; and True, Richard B., to United States of America, Energy. High power linear pulsed beam annealer. 4,371,774, Cl. 219-121.0EA.

Streifer, William: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,371,966, Cl. 372-45.000.

Stricker, Stanley S. Gate panel operator for side dumping vehicles. 4,371,208, Cl. 298-23.00D.

Stroh, Walter; and Schwab, Manfred, to Robert Bosch GmbH. Method and apparatus for computing motor speeds for initiating and ending jolt control during gearshift in a drive system using fluid couplings or torque converters. 4,370,903, Cl. 74-858.000.

Stroh, Walter: *See*—
Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,370,904, Cl. 74-858.000.

Sturesson, Rune K. Eccentric element. 4,370,894, Cl. 74-87.000.

Sturm, Bernd, to Coronet-Metallwarenfabrik GmbH. Sleeve for connecting a handle to a tool. 4,371,282, Cl. 403-277.000.

Suga, Hiroyuki: *See*—
Ohashi, Shigeo; and Suga, Hiroyuki, 4,371,767, Cl. 200-335.000.

Sugier, Andre: *See*—
Chauvin, Yves; Commereuc, Dominique; and Sugier, Andre, 4,371,627, Cl. 518-700.000.

Sugihara, Kunihiko: *See*—
Muranaka, Shigeo; Sugihara, Kunihiko; and Takeuchi, Kiyoshi, 4,370,964, Cl. 123-425.000.

Sugimori, Shiro: *See*—
Daitoku, Koichi; Sekine, Kenji; Matsukawa, Nobuo; and Sugimori, Shiro, 4,371,244, Cl. 354-173.000.

Sugimoto, Takashi: *See*—
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.

Sugino, Takashi: *See*—
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,371,967, Cl. 372-45.000.

Sugita, Kazuhiko: *See*—
Suzuki, Hiroshi; Shibata, Kunio; and Sugita, Kazuhiko, 4,371,216, Cl. 384-118.000.

Sugiura, Saburo: *See*—
Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, 4,371,392, Cl. 75-10.00R.

Sugiyama, Masatoshi; Nakanishi, Ichiro; Ogawa, Akira; and Maekawa, Masakazu, to Fuji Photo Film Co., Ltd. Ink jet recording sheet. 4,371,582, Cl. 428-341.000.

Sulesky, Donald J., to Polaroid Corporation. Apparatus for opening a film processing kit. 4,371,248, Cl. 354-304.000.

Sulzer Brothers Limited: *See*—
Simson, Diosizy, 4,371,009, Cl. 139-452.000.

Sumitomo Chemical Company, Limited: *See*—
Hino, Minoru; and Oshima, Takao, 4,371,665, Cl. 525-109.000.
Saito, Kenji; and Yamachika, Hiroshi, 4,371,711, Cl. 568-310.000.

Sumitomo Heavy Industries, Inc.: *See*—
Tsukuda, Toshio, 4,371,150, Cl. 266-155.000.

Sumitomo, Hiroyuki: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,371,034, Cl. 165-108.000.

Sumitomo Light Metal Ind., Ltd.: *See*—
Nagata, Koji; Nishikawa, Mamoru; and Sato, Shiro, 4,370,944, Cl. 118-302.000.

Sumitomo Metal Industries, Ltd.: *See*—
Takeuchi, Osamu; Kokubun, Haruo; Yoshinaga, Hisashi; Hara, Shuichi; and Ban, Hiromichi, 4,371,149, Cl. 266-90.000.

Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,371,088, Cl. 215-220.000.
Montgomery, Gary V.; and McAlinden, Daniel P., 4,371,095, Cl. 222-153.000.

Sundmar, Goran: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,370,915, Cl. 89-47.000.

Sunsearch, Inc.: *See*—
Clark, Peter D., 4,371,139, Cl. 248-237.000.

Surgant, John M.: *See*—
Le Clair, Francis J.; and Surgant, John M., 4,371,390, Cl. 71-93.000.

Surzhikov, Vitaly A.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Misjulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.

Sutter, Hans-Rudolf, to Bulova Watch Co., Inc. D-C Voltage converter for a wristwatch. 4,371,269, Cl. 368-205.000.

Suwa, Kaname, to Canon Kabushiki Kaisha. Battery containing mechanism of a compact electronic instrument. 4,371,595, Cl. 429-98.000.

Suzuki, Hidetaka: *See*—
Yamaki, Kiyoshi; Mizote, Masanori; Takeda, Hitoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; Kawasaki, Teruo; and Mori, Kazuyuki, 4,371,940, Cl. 364-444.000.

Suzuki, Hiroshi; Shibata, Kunio; and Sugita, Kazuhiko, to Toyoda Koki Kabushiki Kaisha. Fluid bearing. 4,371,216, Cl. 384-118.000.

Suzuki, Kanji, to Kabushiki Kaisha Kinrei Kikai Seisakusho. Stranding device of a stranding machine. 4,370,849, Cl. 57-71.000.

Suzuki, Takahiko: *See*—
Kageyama, Hidehei; and Suzuki, Takahiko, 4,371,277, Cl. 401-54.000.

Suzuki, Yasuo; Nagata, Shuji; and Yasuda, Kazumi, to Nippon Steel Corporation. Method and apparatus for cutting metal pieces into narrower widths. 4,370,910, Cl. 83-876.000.

Suzumura, Takashi: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Svoboda, Josef; and Szabo, Emilie, to TMC Corporation. Ski brake. 4,371,187, Cl. 280-605.000.

Swartout, Bruce E., to U.S. Flywheels, Inc. Flywheel for kinetic energy storage. 4,370,899, Cl. 74-572.000.

Swiss Aluminium Ltd.: *See*—
Moser, Robert; and Jungblut, Gottfried, 4,371,333, Cl. 432-3.000.

Switzer, Jay A.; and Moorehead, Eric L., to Union Oil Company of California. Photoelectrochemical generation of thallium(III). 4,371,431, Cl. 204-59.00R.

Sybron Corporation: *See*—
Grunert, Hans C.; and Becker, Heinz, 4,371,223, Cl. 312-325.000.
Symphar S.A.: *See*—
Bentzen, Craig L.; Nguyen Mong, Lan; and Niesor, Eric, 4,371,527, Cl. 424-204.000.
Synergistics Research Corporation: *See*—
Ferris, Daniel B.; Trossman, Martin M.; and Luchsinger, Charles R., 4,371,166, Cl. 273-157.00R.
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S. Automatic coupling device to connect tractor and tractor-drawn means hydraulic systems. 4,371,004, Cl. 137-899.000.
Szabo, Emilie: *See*—
Svoboda, Josef; and Szabo, Emilie, 4,371,187, Cl. 280-605.000.
Szantho, Charles F.; and Riordan, Edward D., to Joyal Products, Inc. Plural shaft electrode support for fusing machine. 4,371,772, Cl. 219-89.000.
Szell, Valeria: *See*—
Jarai, Miklos; Piukovich, Sandor; Istvan, Sandor; Gado, Istvan; Szell, Valeria; and Barta, Istvan, 4,371,622, Cl. 435-253.000.
Szporny, Laszlo: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Taiho Pharmaceutical Company Limited: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.
Unemi, Norio; Kitazato, Kenji; and Fujii, Setsuro, 4,371,535, Cl. 424-251.000.
Takada, Juichiro. Belt anti-slip device for vehicle safety belt systems. 4,371,193, Cl. 280-806.000.
Takada, Susumu, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Josephson logic gate device. 4,371,796, Cl. 307-476.000.
Takahashi, Hiroshi; and Satoh, Masatoshi, to Kioritz Corporation. Power chain saw. 4,370,809, Cl. 30-381.000.
Takahashi, Munetoshi; and Kato, Takashi, to Kabushiki Kaisha Meiji Gomu Kasei. Gravity structure. 4,371,292, Cl. 405-224.000.
Takahashi, Yosuke: *See*—
Asao, Tomohiro; and Takahashi, Yosuke, 4,370,954, Cl. 123-182.000.
Takamura, Tsutomu: *See*—
Honma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.
Takano, Toshimasa: *See*—
Uchida, Kohachi; Nakatomi, Yoshitsugu; Takano, Toshimasa; and Mukai, Hideo, 4,371,252, Cl. 355-3.0CH.
Takashima, Kunihide: *See*—
Harase, Jiro; Takashima, Kunihide; and Nakashima, Shozaburo, 4,371,405, Cl. 148-111.000.
Takata, Zitumi: *See*—
Hamada, Kaduto; Takata, Zitumi; and Numata, Katuhisa, 4,371,487, Cl. 264-49.000.
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Company, Ltd. Cephalosporin compounds. 4,371,531, Cl. 424-246.000.
Takeda Chemical Industries, Ltd.: *See*—
Akimoto, Hiroshi; and Kawai, Akiyoshi, 4,371,533, Cl. 424-248.540.
Takeda, Hitoshi: *See*—
Yamaki, Kiyoshi; Mizote, Masanori; Takeda, Hitoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; Kawasaki, Teruo; and Mori, Kazuyuki, 4,371,940, Cl. 364-444.000.
Takeda, Kasuhiro: *See*—
Honma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kasuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.
Takeda Lace Co. Ltd.: *See*—
Nakagaki, Noboru; and Fujikawa, Hroaki, 4,370,871, Cl. 66-202.000.
Takeichi, Hitoshi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; Ohno, Mitio; and Matumoto, Hirozi, to Kodaira, Kuniyasu. Medical measuring apparatus. 4,370,985, Cl. 128-663.000.
Takeuchi, Kiyoshi: *See*—
Muranaka, Shigeo; Sugihara, Kunihiko; and Takeuchi, Kiyoshi, 4,370,964, Cl. 123-425.000.
Takeuchi, Mikio: *See*—
Kawasaki, Teruo; Nomura, Hiroyuki; and Takeuchi, Mikio, 4,371,864, Cl. 340-62.000.
Takeuchi, Naoki: *See*—
Watanabe, Toshihiko; Takeuchi, Naoki; Tsuruga, Soichi; and Koishi, Tadatsugu, 4,371,107, Cl. 228-32.000.
Takeuchi, Osamu; Kokubun, Haruo; Yoshinaga, Hisashi; Hara, Shuichi; and Ban, Hiromichi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Apparatus for cooling sheet steel by water spraying. 4,371,149, Cl. 266-90.000.
Takikawa, Katsuo: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., to Canon Kabushiki Kaisha; and Texas Instruments Incorporated. Photographic mode selector system. 4,371,243, Cl. 354-43.000.
Takito, Tetsuo: *See*—
Horita, Yoshiharu; Fujimoto, Kenichi; Hoshino, Michio; Takito, Tetsuo; and Muraki, Masayoshi, 4,371,726, Cl. 585-3.000.
Tamm, Rolf G. A., to Bodenseewerk Perkin-Elmer & Co., GmbH. Holder for absorption spectrometer atomizing furnace capsules. 4,371,262, Cl. 356-312.000.
Tammen, Bobby J. Top dice roulette game. 4,371,165, Cl. 273-147.000.
Tan-Atichat, Eddie: *See*—
De, Bimal B.; Gierut, Lawrence G.; Krakau, Herbert B.; Naik, Kirit; and Tan-Atichat, Eddie, 4,371,754, Cl. 179-18.0EE.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Ion-nitriding apparatus. 4,371,787, Cl. 422-186.060.
Tanaka, Akira, to American Safety Equipment Corp. Seat belt retractor assembly with pawl mounted pendulum. 4,371,128, Cl. 242-107.40A.
Tanaka, Hideharu: *See*—
Uchikawa, Fusaoki; Tanaka, Hideharu; Sekiya, Mutsuo; and Ohata, Yasufumi, 4,371,581, Cl. 428-304.400.
Tanaka, Junzo: *See*—
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,371,769, Cl. 219-10.55F.
Tanaka, Kenichi, to Kakuichi Co. Ltd. Process for manufacturing synthetic resin hose having a reinforcing member embedded therein and apparatus thereof. 4,371,415, Cl. 156-433.000.
Tanaka, Kentaro; Tsuji, Naoki; Kondo, Eiji; and Kawamura, Yoshimi, to Shionogi & Co., Ltd. Process for preparing thienamycin. 4,371,617, Cl. 435-119.000.
Tanaka, Kimio: *See*—
Okamura, Masatohsi; and Tanaka, Kimio, 4,371,131, Cl. 242-199.000.
Tanaka, Meguru: *See*—
Yanagisawa, Takao; and Tanaka, Meguru, 4,371,475, Cl. 260-512.00R.
Tangorra, Giorgio: *See*—
Cicognani, Mario; Tangorra, Giorgio; and Cimatti, Gianfranco, 4,371,363, Cl. 474-205.000.
Tani, Yoshiki: *See*—
Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,371,621, Cl. 435-191.000.
Taniguchi, Matsuyoshi: *See*—
Wakabayashi, Masayoshi; and Taniguchi, Matsuyoshi, 4,371,250, Cl. 354-325.000.
Taniguchi, Mitsuo: *See*—
Kashiwase, Kohji; Machino, Yasuo; Mita, Muneo; Hiramatsu, Tsunenosuke; Morishita, Toshihiko; and Taniguchi, Mitsuo, 4,371,656, Cl. 524-443.000.
Taniguchi, Yoshihiro: *See*—
Yoshimoto, Takeshi; Hiraoka, Hideki; Okazaki, Seiji; Taniguchi, Yoshihiro; and Harada, Tsutomu, 4,371,260, Cl. 355-77.000.
Tank, Eggert, to Daimler-Benz Aktiengesellschaft. Bucket for an adjustable turbine inlet guide baffle system. 4,371,312, Cl. 415-200.000.
Tanner, Donald M.; and Potts, Herbert M., to Container Corporation of America. Two-cell bulk container tubes. 4,371,109, Cl. 229-28.00R.
Tansil, Thomas B.: *See*—
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,371,752, Cl. 179-7.1TP.
Tanuma, Itsuo: *See*—
Honda, Toshio; Fukuura, Yukio; Ishikawa, Hikaru; Kojima, Shozo; Tanuma, Itsuo; and Ogawa, Masao, 4,371,411, Cl. 156-281.000.
Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tatsumi, Hideo; and Tohkairin, Akira, 4,370,793, Cl. 29-446.000.
Taylor, Charles H. Applicator for liquid cosmetics. 4,370,989, Cl. 132-79.00B.
Taylor, G. Brandt, to Durkin, William N., a part interest. Solar still. 4,371,623, Cl. 435-290.000.
TBS, Inc.: *See*—
Simons, Peter B., 4,371,015, Cl. 141-352.000.
TDK Electronics Co., Ltd.: *See*—
Izumi, Toshiaki; Saito, Seitoku; Maruta, Fumio; and Kameya, Minoru, 4,371,590, Cl. 428-555.000.
Okamura, Masatohsi; and Tanaka, Kimio, 4,371,131, Cl. 242-199.000.
Okamura, Masatoshi; and Shiba, Haruo, 4,371,286, Cl. 403-407.000.
Teague, Lyndon M. Waste container with permanent lid hold-down assemblies. 4,371,092, Cl. 220-324.000.
Teague, W. Dorwin, Jr., to Murphy Door Bed Company, Inc. Panel bed and counterbalancing mechanism for panel bed. 4,370,766, Cl. 5-133.000.
Tegyei, Zsuzsanna: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Telettra-telefonia Elettronica e Radio S.p.A.: *See*—
Zingrini, Carlo; and Oreglio, Maurizio, 4,371,083, Cl. 211-26.000.
Terasaki, Masahiro. Cigarette holder smoke filtering cartridge with two stage smoke purification action. 4,370,988, Cl. 131-201.000.
Tetra Pak International AB: *See*—
Pozna, Laszlo, 4,371,768, Cl. 219-10.530.
Rausing, Hans A., 4,371,364, Cl. 493-7.000.
Texaco Development Corporation: *See*—
McEntire, Edward E.; and Gipson, Robert M., 4,371,704, Cl. 549-518.000.

Texaco Inc.: *See*—
Austin, Thomas H., 4,371,629, Cl. 521-115.000.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,378, Cl. 48-86.00R.
Brent, Albert; Marion, Charles P.; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,371,379, Cl. 48-197.00R.
Lin, Jiang-Jen; and Knifton, John F., 4,371,724, Cl. 568-902.000.
McCoy, David R.; and Naylor, Carter G., 4,371,444, Cl. 252-8.55D.
Nieh, Edward C. Y., 4,371,450, Cl. 252-189.000.

Texas Instruments Incorporated: *See*—
Lien, Jih-Chang; and Chiu, Te-Long, 4,370,798, Cl. 29-576.00B.
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.

Th. Goldschmidt AG: *See*—
Fock, Jurgen; Schedlitzki, Dietmar; Holtschmidt, Ulrich; and Ahrens, Wilhelm, 4,371,683, Cl. 528-60.000.

Thallmeier, Manfred: *See*—
Steffen, Klaus-Dieter; and Thallmeier, Manfred, 4,371,709, Cl. 568-33.000.

Thayer, Theodore B.: *See*—
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,371,074, Cl. 198-339.000.

Thiele, Gerd: *See*—
Bube, Carsten; Dull, Ernst H.; Thiele, Gerd; and Zeller, Hans, 4,371,910, Cl. 361-106.000.

Thir, Basil: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,371,476, Cl. 260-709.000.

Tholen, Paul, to Klockner-Humboldt-Deutz AG. Auxiliary air heater. 4,371,112, Cl. 237-12.30A.

Thomas & Betts Corporation: *See*—
Hidassy, Laszlo, 4,371,010, Cl. 140-93.00A.
Hidassy, Laszlo, 4,371,011, Cl. 140-93.200.
Narozny, Ronald S., 4,371,225, Cl. 339-97.00C.
Peterpaul, Joseph, 4,370,881, Cl. 72-402.000.

Thomas, Daniel W., to American Cyanamid Co. Particle size reduction of pigments by non-salt milling. 4,371,643, Cl. 524-88.000.

Thomas, Richard E.; Haas, George A.; and Greene, Richard F., to United States of America, Navy. Integral-shadow-grid contrqlled-porosity dispenser cathode. 4,371,809, Cl. 313-449.000.

Thompson, Roy F., to A. C. Egerton Limited. Heat shrinkable material for wrapping around a pipe, cable or the like. 4,371,578, Cl. 428-192.000.

Thomson-CSF: *See*—
Cornet, Jean, 4,371,954, Cl. 365-126.000.
Deville, Christian; and Lafuma, Philippe, 4,371,852, Cl. 333-157.000.
Lacombat, Michel; and Dubroeucq, Georges, 4,371,264, Cl. 356-356.000.

Thornton, Donald I., to Fram Corporation. Cam actuated filter assembly. 4,371,439, Cl. 210-232.000.

Tietze, Jurgen: *See*—
Danguillier, Wilhelm; Grams, Wolfgang; and Tietze, Jurgen, 4,371,425, Cl. 202-228.000.

Tignol, Adrien P. N.: *See*—
Alicot, Michel J. C.; and Tignol, Adrien P. N., 4,371,698, Cl. 548-177.000.

Tinchant, Xavier: *See*—
Guilpain, Bernard; and Tinchant, Xavier, 4,371,970, Cl. 373-74.000.

Tiollais, Pierre, to Institut Pasteur; and Inst. Nat'l de la Sante et Recherche. Vectors for the insertion therein of foreign DNA fragments, according to any translation phase. 4,371,625, Cl. 435-317.000.

Tischer, Werner, to Zahnradfabrik Friedrichshafen, AG. Hydrostatic steering system. 4,371,002, Cl. 137-625.300.

Titan Tool Co.: *See*—
McKean, John A., 4,371,354, Cl. 464-36.000.

TMC Corporation: *See*—
Svoboda, Josef; and Szabo, Emilie, 4,371,187, Cl. 280-605.000.

Tobita, Etsuo: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Tobita, Etsuo, 4,371,647, Cl. 524-120.000.

Toh Zinc Company Limited: *See*—
Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, 4,371,440, Cl. 210-601.000.

Tohkairin, Akira: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tatsumi, Hideo; and Tohkairin, Akira, 4,370,793, Cl. 29-446.000.

Tohto Kasei Co., Ltd.: *See*—
Hino, Minoru; and Oshima, Takao, 4,371,665, Cl. 525-109.000.

Tokai Electric Wire Company Limited: *See*—
Inoue, Nori, 4,371,230, Cl. 339-242.000.

Tokarzewski, Richard J.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,371,715, Cl. 568-659.000.

Tokes, Szabolcs: *See*—
Podmaniczky, Andras; Tokes, Szabolcs; and Lenk, Attila M., 4,371,964, Cl. 372-38.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Kamiyama, Kiichi; and Oana, Yoshinori, 4,371,237, Cl. 351-245.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Andow, Fumio; Kobayashi, Takayuki; Kondow, Ryotaro; and Nii, Yoshiji, 4,371,908, Cl. 361-83.000.
Fujisawa, Norio, 4,371,947, Cl. 364-900.000.
Honma, Hideo; Ikari, Kunihiro; Sasaki, Osamu; Sasabe, Toshiki; Takeda, Kazuhiro; and Takamura, Tsutomu, 4,371,397, Cl. 106-1.230.
Kurosawa, Kei, 4,371,407, Cl. 148-187.000.
Murata, Moriyoshi, 4,371,492, Cl. 264-226.000.
Uchida, Kohachi; Nakatomi, Yoshitsugu; Takano, Toshimasa; and Mukai, Hideo, 4,371,252, Cl. 355-3.0CH.
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Okamoto, Eiichi, 4,371,926, Cl. 364-200.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Fukuda, Tsuguo; and Hirano, Hitoshi, 4,371,419, Cl. 156-617.0SP.

Tomita, Tadayoshi: *See*—
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, 4,371,452, Cl. 252-373.000.

Tompakov, Alexandr E.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.

Tone, Fumihiro; and Fujishima, Toshihiko, to Idemitsu Petrochemical Co., Ltd. Three-component resin compositions having improved coating properties. 4,371,662, Cl. 525-89.000.

Tong, Yulan C.: *See*—
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,371,537, Cl. 424-263.000.

Top-Scor Products, Inc.: *See*—
Forsythe, Curtis J., 4,371,561, Cl. 426-653.000.

Topfl, Rosemarie, to Ciba-Geigy Corporation. Mixtures of reactios products based on epoxides, primary amines and fatty acids and of aminoplast precondensates, their preparation and their use as leather dressings. 4,371,637, Cl. 523-416.000.

Tornatore, Giovanni; and Bogetti, Lorenzo, to Fiat Auto S.p.A. Autonomous electrical power generator. 4,371,828, Cl. 322-32.000.

Tortorello, Anthony J.: *See*—
Mylonakis, Stamatios G.; and Tortorello, Anthony J., 4,371,669, Cl. 526-311.000.

Toshiba Silicones, Ltd.: *See*—
Hashimoto, Mitsuyoshi, 4,371,682, Cl. 528-34.000.

Toto, Ltd.: *See*—
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,370,764, Cl. 4-443.000.

Tousey, Gordon. Marine stern drive cooler. 4,371,351, Cl. 440-88.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Kikuchi, Toshiro; Ogawa, Masaru; and Ando, Makoto, 4,371,620, Cl. 435-189.000.

Toyo Engineering Corporation: *See*—
Ohsaki, Kozo; Hirokawa, Kazuo; Fukuda, Goro; Otsuka, Kozi; and Tomita, Tadayoshi, 4,371,452, Cl. 252-373.000.

Toyo Jozo Company, Ltd.: *See*—
Matsumoto, Kunio; Izumi, Rokuro; Seijo, Hideji; and Mizuguchi, Hiroyuki, 4,371,612, Cl. 435-44.000.

Toyo Kogyo Co., Ltd.: *See*—
Otsuka, Kazutoshi, 4,370,960, Cl. 123-339.000.

Toyo Shokuhinkikai Kabushiki Kaisha: *See*—
Shingo, Hiromichi, 4,371,365, Cl. 493-25.000.

Toyoboseki Kabushiki Kaisha: *See*—
Hamada, Kaduto; Takata, Zitumi; and Numata, Katuhisa, 4,371,487, Cl. 264-49.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Suzuki, Hiroshi; Shibata, Kunio; and Sugita, Kazuhiko, 4,371,216, Cl. 384-118.000.

Toyoda, Shigeru: *See*—
Fujita, Teizo; Dohmoto, Hidetaka; and Toyoda, Shigeru, 4,371,922, Cl. 364-144.000.

Toyoda, Takashi; Itoh, Isamu; and Yamada, Minoru, to Fuji Photo Film Co., Ltd. Process for development-processing silver halide light-sensitive material. 4,371,610, Cl. 430-445.000.

Toyoshima, Shigeshi: *See*—
Sato, Minoru; Hirose, Yoshiteru; and Toyoshima, Shigeshi, 4,371,577, Cl. 428-96.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Furukubo, Tatsumi, 4,370,950, Cl. 123-41.080.
Kawaguchi, Hiroshi, 4,371,215, Cl. 303-22.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Nakamura, Norihiko; and Kato, Takashi, 4,371,479, Cl. 261-44.00C.
Nakatomi, Takayoshi, 4,370,968, Cl. 123-488.000.
Shinoda, Kazuo; Higashigawa, Keizo; and Shiozawa, Ken, 4,371,000, Cl. 137-434.000.
Tsuge, Hiroshi; Kawaharazaki, Takashi; and Yasumatsu, Jun, 4,371,126, Cl. 242-107.200.

Toyoto Jidosha Kogyo Kabushiki Kaisha: *See*—
Maruyama, Katsuaki, 4,370,898, Cl. 74-540.000.

Travaux et Produits Routiers: *See*—
Langumier, Georges, 4,371,401, Cl. 106-281.00R.

Triggs, Dennis R.; and Coulter, Howard W. Apparatus for marking preselected measurements. 4,370,811, Cl. 33-32.00R.

Troemner, James O.; Wetrich, Peter D.; and Volz, William A., to Deere & Company. Park-lock mechanism. 4,371,063, Cl. 192-4.00A.

Trossman, Martin M.: *See*—
Ferris, Daniel B.; Trossman, Martin M.; and Luchsinger, Charles R., 4,371,166, Cl. 273-157.00R.

True, Richard B.: *See*—
Strathman, Michael D.; Sadana, Devendra K.; and True, Richard B., 4,371,774, Cl. 219-121.0EA.
Trussell, C. Ward, Jr.; and Miller, James E., to United States of America, Army. Monolithic injection laser arrays formed by crystal regrowth techniques. 4,371,968, Cl. 372-50.000.
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., to Etablissements Nativelle S.A. Spiro derivatives, process for their preparation and medications containing same. 4,371,538, Cl. 424-267.000.
Tsaur, Bor-Yeu: *See*—
Fan, John C. C.; Geis, Michael W.; and Tsaur, Bor-Yeu, 4,371,421, Cl. 156-624.000.
Tschanz, Pierre Y. Selectively interconnectable information card holder arrangement. 4,370,820, Cl. 40-388.000.
Tschirner, Wolfgang, to Kleinewefers GmbH. Apparatus for continuously treating strand-like textile material in vertical loops. 4,370,872, Cl. 68-158.000.
Tsuge, Hiroshi; Kawaharazaki, Takashi; and Yasumatsu, Jun, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki-Kaisha Tokairika-Denki-Seisakusho. Webbing lock device. 4,371,126, Cl. 242-107.200.
Tsuji, Kiyoshi: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,371,531, Cl. 424-246.000.
Tsuji, Naoki: *See*—
Tanaka, Kentaro; Tsuji, Naoki; Kondo, Eiji; and Kawamura, Yoshimi, 4,371,617, Cl. 435-119.000.
Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Range finder. 4,371,261, Cl. 356-1.000.
Tsukuda, Toshio, to Sumitomo Heavy Industries, Inc. Sintering plant. 4,371,150, Cl. 266-155.000.
Tsuruga, Kouji: *See*—
Leistner, William E.; Minagawa, Motonobu; Tsuruga, Kouji; and Harada, Masashi, 4,371,651, Cl. 524-178.000.
Tsuruga, Soichi: *See*—
Watanabe, Toshihiko; Takeuchi, Naoki; Tsuruga, Soichi; and Koishi, Tadatsugu, 4,371,107, Cl. 228-32.000.
Tubbs, Joseph T.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,370,806, Cl. 29-749.000.
Tudos nee Feuer, Helga: *See*—
Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, 4,371,534, Cl. 424-248.550.
Tuggle, Lloyd H., to Emerson Electric Co. Muffler for portable engine. 4,370,855, Cl. 60-317.000.
Tully, Paul R. Method for dyeing eggs. 4,371,555, Cl. 426-250.000.
Turnbull, John, to Celanese Corporation. Belting fabric. 4,370,784, Cl. 28-166.000.
Turner Quick-Lift Corporation: *See*—
Vandenberg, Ervin K., 4,371,190, Cl. 280-705.000.
Turza, Jozef; Kilik, Ondrej; and Rusnak, Jan, to Zavody tazkeho strojarstva, narodni podnik. Hydrostatic sliding element. 4,371,217, Cl. 308-5.00R.
Twiford, Richard L.: *See*—
Moller, George O.; and Twiford, Richard L., 4,370,921, Cl. 99-405.000.
Tyler Refrigeration Corporation: *See*—
Abraham, Fayez F., 4,370,866, Cl. 62-256.000.
Ibrahim, Fayez F., 4,370,867, Cl. 62-256.000.
Tyman, John H. P.: *See*—
Alexiou, Michael S.; Brittain, Philip I.; and Tyman, John H. P., 4,371,694, Cl. 546-100.000.
Tyrell, John A.: *See*—
Rosenquist, Niles R.; and Tyrell, John A., 4,371,650, Cl. 524-162.000.
U.C. Industries: *See*—
Phipps, Arthur L.; and Stoyanov, Ben, 4,371,488, Cl. 264-51.000.
Uchida, Kohachi; Nakatomi, Yoshitsugu; Takano, Toshimasa; and Mukai, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Contact type charging device with pliable contact member. 4,371,252, Cl. 355-3.0CH.
Uchidoi, Masanori: *See*—
Takishima, Yoshiyuki; Uchidoi, Masanori; Mashimo, Yukio; Aizawa, Hiroshi; and Kwan, Stephen C., 4,371,243, Cl. 354-43.000.
Uchikawa, Fusaoki; Tanaka, Hideharu; Sekiya, Mutsuo; and Ohata, Yasufumi, to Mitsubishi Denki Kabushiki Kaisha. Sound absorber. 4,371,581, Cl. 428-304.400.
Uchikuga, Saburo: *See*—
Okazaki, Tethuharu; Komukai, Takeo; and Uchikuga, Saburo, 4,371,472, Cl. 260-453.0RY.
Uchiyama, Hiroki: *See*—
Saruta, Masahiro; and Uchiyama, Hiroki, 4,370,966, Cl. 123-447.000.
Uemura, Hiroshi: *See*—
Kinoshita, Hirotsugu; Uemura, Hiroshi; and Sekiya, Makoto, 4,371,446, Cl. 252-51.50A.
Uemura, Yahiro; Goto, Takashi; Kano, Yoshiaki; and Funakoshi, Satoshi, to Green Cross Corporation, The. Process for preparing immunoglobulin suitable for intravenous injection. 4,371,520, Cl. 424-85.000.
Ulion, Nicholas E.: *See*—
Goebel, Joseph A.; Barkalow, Richard H.; and Ulion, Nicholas E., 4,371,570, Cl. 427-248.100.
Ulmann, Jean-Pierre, to Etablissements Georges Klein. Devices of the turnstile kind for controlling passages requiring authorization. 4,370,825, Cl. 49-47.000.
Ulrich, Gunther: *See*—
Siemens, Walter; Ulrich, Gunther; and Bartusel, Karl R., 4,371,103, Cl. 225-1.000.
Ulrich, Werner, to Bell Telephone Laboratories, Incorporated. Defective short holding-time trunk identifying method. 4,371,758, Cl. 179-175.20C.
Umemoto, Teruo, to Sagami Chemical Research Center. Perfluoroalkyl compounds and process for preparing the same. 4,371,710, Cl. 568-35.000.
Unemi, Norio; Kitazato, Kenji; and Fujii, Setsuro, to Taiho Pharmaceutical Company Limited. Method of and composition for delivering 5-fluorouracil to tumors. 4,371,535, Cl. 424-251.000.
Unglert, Melvin C.: *See*—
Murphy, John J.; Petro, John; and Unglert, Melvin C., 4,371,224, Cl. 316-32.000.
Uni-Cardan AG: *See*—
Petrzelka, Miloslav; and Krude, Werner, 4,371,357, Cl. 464-128.000.
Union Carbide Corporation: *See*—
Jenkins, John M., III; Carter, Max E., Sr.; Green, Michael L.; and Cavender, Marvin E., 4,371,977, Cl. 378-51.000.
Schulz, David A., 4,371,129, Cl. 242-118.700.
Schwartz, Robert D.; and Keller, Frederick A., Jr., 4,371,619, Cl. 435-140.000.
Winn, Jackie L., 4,371,776, Cl. 219-130.510.
Union Oil Company of California: *See*—
Switzer, Jay A.; and Moorehead, Eric L., 4,371,431, Cl. 204-59.00R.
Unique Energy Systems, Inc.: *See*—
Papineau, Ronald I., 4,371,500, Cl. 422-115.000.
U.S. Flywheels, Inc.: *See*—
Swartout, Bruce E., 4,370,899, Cl. 74-572.000.
United States of America
Agriculture: *See*—
Foglia, Thomas A.; Perlstein, Theodore; Nakano, Yoshio; and Maerker, Gerhard, 4,371,469, Cl. 260-405.600.
Air Force: *See*—
Williams, Raymond L., 4,370,854, Cl. 60-261.000.
Army: *See*—
Esaki, Leo; and Chang, Chin-An, 4,371,884, Cl. 357-12.000.
Rodgers, Aubrey, 4,371,784, Cl. 250-231.0GY.
Smith, James L., 4,371,866, Cl. 340-146.30F.
Trussell, C. Ward, Jr.; and Miller, James E., 4,371,968, Cl. 372-50.000.
Energy: *See*—
Davis, Jefferson W., Jr., 4,371,705, Cl. 562-444.000.
McGuire, Patrick L.; and Barraclough, Bruce L., 4,371,045, Cl. 175-17.000.
Strathman, Michael D.; Sadana, Devendra K.; and True, Richard B., 4,371,774, Cl. 219-121.0EA.
Health and Human Services: *See*—
Lee, William W.; Brown, J. Martin; Martinez, Abelardo P.; and Cory, Michael J., 4,371,540, Cl. 424-273.00R.
Pert, Candace B.; and Chang, Jaw-Kang, 4,371,463, Cl. 260-112.50E.
Pitha, Josef, 4,371,673, Cl. 525-426.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Jain, Atul. Clutter free synthetic aperture radar correlator. 4,371,873, Cl. 343-9.0PS.
National Aeronautics and Space Administration: *See*—
Constantinides, Nicholas J.; and Bicknell, Thomas J., 4,371,946, Cl. 364-822.000.
Lawson, Ashby G., 4,371,301, Cl. 411-517.000.
Sheibley, Dean W., 4,371,596, Cl. 429-144.000.
Navy: *See*—
Bloom, Richard L., 4,371,874, Cl. 343-18.00B.
Faccini, Ernest C.; and Wergen, Thomas E., 4,371,771, Cl. 219-70.000.
Griscom, David L., 4,371,838, Cl. 324-244.000.
Henry, John W., IV; and Cassel, David E., 4,371,310, Cl. 415-211.000.
Jensen, James D.; and Schoolar, Richard B., 4,371,232, Cl. 350-1.400.
Morris, Hayden; and Bis, Richard F., 4,371,882, Cl. 357-4.000.
Stevenson, David A., 4,371,420, Cl. 156-624.000.
Thomas, Richard E.; Haas, George A.; and Greene, Richard F., 4,371,809, Cl. 313-449.000.
U.S. Philips Corporation: *See*—
Boeke, Wouter M., 4,371,844, Cl. 330-253.000.
Dijkmans, Eise C.; and Immink, Kornelis A., 4,371,748, Cl. 179-1.00J.
Doussot, Michel; and Courtois, Christian, 4,371,877, Cl. 343-770.000.
Eckert, Wolfgang; Holtkamp, Bernd; and Kilian, Ernst A., 4,371,841, Cl. 330-51.000.
Gotje, Egbert B. G. W.; and Kerstens, Franciscus N. A., 4,371,848, Cl. 331-91.000.
Longley, Stuart R., 4,371,849, Cl. 331-96.000.
Mulder, Cornelis; Nederlof, Leendert; Niessen, Cornelis; Wijnhoven, Rene M. G.; and Salters, Roelof H. W., 4,371,795, Cl. 307-440.000.

Schwarz, Dieter; Misner, Ralf; and Glasbergen, Johannes W., 4,371,972, Cl. 375-30.000.
Van de Grift, Robert E. J.; Van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,371,868, Cl. 340-347.0CC.
van Gorkom, Gerardus G. P.; and Hoeberechts, Arthur M. E., 4,370,797, Cl. 29-569.00R.
Wagner, Wolfgang, 4,371,976, Cl. 378-16.000.

United Technologies Corporation: *See—*
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,936, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,937, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,939, Cl. 364-434.000.
Duhl, David N.; and Nguyen-Dinh, Xuan, 4,371,404, Cl. 148-3.000.
Goebel, Joseph A.; Barkalow, Richard H.; and Ulion, Nicholas E., 4,371,570, Cl. 427-248.100.
Walsh, Thomas C., 4,371,311, Cl. 415-182.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,371,938, Cl. 364-434.000.

University of California, The Regents of the: *See—*
Grodsky, Gerold M.; and Bringer, Jacques, 4,371,523, Cl. 424-178.000.
Hull, Maury L., 4,371,188, Cl. 280-613.000.

UOP Inc.: *See—*
Vickers, Anthony G., 4,371,453, Cl. 252-417.000.
Vickers, Anthony G., 4,371,501, Cl. 422-142.000.
Wagner, Walter R.; and Duda, Richard M., 4,370,919, Cl. 98-122.000.

UPZ kam Vimmess: *See—*
Kyuchukov, Yanko P., 4,371,432, Cl. 204-129.350.

Uranerzbergbau GmbH & Co. KG: *See—*
Bals, Hans G., 4,371,442, Cl. 210-661.000.

Uranium Recovery Corporation: *See—*
Leaders, William M.; and Harrington, Charles D., 4,371,504, Cl. 423-10.000.

Urano, Tadao; and Kaneko, Isamu, to Iwatsu Electric Co., Ltd. One-gun two-beam cathode ray tube. 4,371,808, Cl. 313-411.000.

Urbanc, David J.: *See—*
Pickering, William; and Urbanc, David J., 4,370,891, Cl. 73-861.030.

Urogdi, Laszlo; Patthy nee Lukats, Agnes; Kisfaludy, Lajos; Moravcsik, Erno; Tudos nee Feuer, Helga; Otvos, Laszlo; Tegyei, Zsuzsanna; Palosi, Eva; Sarkadi, Adam; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar RT. N4-Substituted tetrahydro-1,2,4-oxadiazin-5-one derivatives having anticonvulsive activity and pharmaceutical compositions containing them. 4,371,534, Cl. 424-248.550.

USM Corporation: *See—*
Gordiski, Ronald J.; Bennett, Robert G., Jr.; Parrella, Alfred T.; and Bagnall, Michael, 4,371,941, Cl. 364-475.000.
Kondo, Yoshiteru, 4,371,773, Cl. 219-98.000.

Utagawa, Takashi; Miyoshi, Takeshi; Morisawa, Hirokazu; Yamazaki, Akihiro; Yoshinaga, Fumihiro; and Mitsugi, Koji, to Ajinomoto Company Incorporated. Method for producing purine arabinosides. 4,371,613, Cl. 435-88.000.

Utken, Jay: *See—*
Lipp, Ellis P.; and Utken, Jay, 4,371,862, Cl. 338-174.000.

VALEO Societe Anonyme: *See—*
Billet, Rene, 4,371,068, Cl. 192-98.000.

Valstyn, Erich P.; and Kelley, G. Vinson, to Computer & Communications Technology Corporation. High resolution hall effect read head. 4,371,905, Cl. 360-112.000.

Van Aken, Andre B.: *See—*
Paxson, Timm E.; Kim, Leo; and Van Aken, Andre B., 4,371,716, Cl. 568-678.000.

Van de Grift, Robert E. J.; Van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Method and device for the automatic calibration of an analog-to-digital converter. 4,371,868, Cl. 340-347.0CC.

Vandenberg, Ervin K., to Turner Quick-Lift Corporation. Axle suspension system. 4,371,190, Cl. 280-705.000.

van den Berg, Johan H.; and Le Sausse, Robert T., to Champion Spark Plug Europe, S.A. Multi-purpose connector. 4,370,775, Cl. 15-250.320.

Van de Plassche, Rudy J.: *See—*
Van de Grift, Robert E. J.; Van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,371,868, Cl. 340-347.0CC.

Van de Sande, Christian C.; Janssens, Wilhelmus; Lassig, Wolfgang; and Meier, Ernst, to Agfa-Gevaert, N.V. Photographic material suited for use in diffusion transfer photography. 4,371,604, Cl. 430-223.000.

Van de Walker, Peter G., to Outboard Marine Corporation. Cylinder two stroke engine with torsional resonance control. 4,370,953, Cl. 123-55.0VS.

Van Dyk, Garritt C., Jr., to Keene Corporation. Inflatable gasket for radio frequency shielding enclosure. 4,371,175, Cl. 277-34.000.

van Gorkom, Gerardus G. P.; and Hoeberechts, Arthur M. E., to U.S. Philips Corporation. Method of semiconductor device for generating electron beams. 4,370,797, Cl. 29-569.00R.

Vanhulle, Gary L.: *See—*
George, Richard D.; and Vanhulle, Gary L., 4,371,204, Cl. 296-218.000.

Van Iperen, Willem H. P., to Sea-Land Industries, Inc. Vehicle supporting ramps for cargo containers. 4,371,298, Cl. 410-25.000.

Van Laar, Jacobus, to Estel Hoogovens BV. Shaft furnace, particularly the refractory construction of the bottom thereof. 4,371,334, Cl. 432-95.000.

Vanlerberghe, Guy; Sebag, Henri; Zyuman, Alexandre; and Dubief, Claude, to L'Oreal. Composition for treating fibrous materials, based on cationic and anionic polymers. 4,371,517, Cl. 424-70.000.

Van Pool, Joe, to Phillips Petroleum Company. Alkylation process. 4,371,732, Cl. 585-723.000.

Vapor Corporation: *See—*
Diamond, John A., 4,371,762, Cl. 200-61.430.

Varca, Robert J.: *See—*
Scordato, Richard E.; and Varca, Robert J., 4,371,498, Cl. 422-102.000.

Varian Associates, Inc.: *See—*
Cohn, Seymour B.; Karp, Arthur; and Stone, David S., 4,371,854, Cl. 333-252.000.

VE.DA. S.r.l: *See—*
Zambelli, Alessio, 4,370,816, Cl. 34-76.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Marx, Karl; Winkler, Klaus; Schmidt, Kurt; and Jentzsch, Joachim, 4,371,158, Cl. 271-103.000.
Weisbach, Gunter; Lucius, Gunter; and Plage, Dieter, 4,370,928, Cl. 101-242.000.

Veco International, Inc.: *See—*
DeVecchi, Francisco, 4,371,386, Cl. 55-338.000.

Velsher, Benne: *See—*
Debortoli, George; Meyerstein, Michael V.; and Velsher, Benne, 4,371,757, Cl. 179-98.000.

Vemag: *See—*
Meier, Dieter, 4,370,779, Cl. 17-49.000.

Vermalle, Jean-Claude: *See—*
Marello, Georges; and Vermalle, Jean-Claude, 4,371,134, Cl. 244-173.000.

Vermillion, Eugene F., to Columbus Show Case Company, The. Curtain wall. 4,370,838, Cl. 52-36.000.

Verzella, David J.: *See—*
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,936, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,937, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,939, Cl. 364-434.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,371,938, Cl. 364-434.000.

Vest, Hugh F.: *See—*
Webb, Thomas H.; Vest, Hugh F.; and Chan, Keng S., 4,371,447, Cl. 252-73.000.

Vesterling, Friedrich, to WNY Hospital Television, Inc. Method and apparatus for affording selective access to additional television channels. 4,371,979, Cl. 455-180.000.

Vickers, Anthony G., to UOP Inc. Fluid catalyst regeneration process and apparatus. 4,371,453, Cl. 252-417.000.

Vickers, Anthony G., to UOP Inc. Fluid catalyst regeneration apparatus. 4,371,501, Cl. 422-142.000.

Victor Company of Japan, Ltd.: *See—*
Yamada, Yasuhiro, 4,371,270, Cl. 371-38.000.

Victor United, Inc.: *See—*
Stewart, William R.; and Simonds, Gary, 4,370,972, Cl. 124-23.00R.

Vidal, Jean-Pierre. System for propulsion of boats by means of winds and streams and for recovery of energy. 4,371,346, Cl. 440-8.000.

Vitzthum, Gunther: *See—*
Mathes, Nikolaus; Pitowski, Hans J.; and Vitzthum, Gunther, 4,371,441, Cl. 210-649.000.

Vlassara, Helen: *See—*
Cerami, Anthony; Brownlee, Michael; and Vlassara, Helen, 4,371,374, Cl. 23-230.00B.

VLSI Technology Research Association: *See—*
Yoshizawa, Rokuro; and Shinozaki, Satoshi, 4,371,423, Cl. 156-653.000.

Voegele, Jean D.; Jourdheuil, Pierre E. J.; Pizzol nee Dalmasso, Jeannine M.; and Pintureau, Bernard C. J., to Institut National de la Recherche Agronomique - UNRA. Method for conditioning and preserving eggs of insect oophage parasites or process for conditioning and preservation of eggs of oophagous parasites of insects. 4,370,946, Cl. 119-1.000.

Voegeli, Ronald. Coin-operated latch mechanism. 4,371,072, Cl. 194-54.000.

Voest-Alpine Aktiengesellschaft: *See—*
Muhlbauer, Gerhard; and Holler, Herbert, 4,371,100, Cl. 222-591.000.

Voetz, Franz J.: *See—*
May, Adolf; Voetz, Franz J.; and Gerl, August, 4,371,399, Cl. 106-109.000.

Vohwinkel, Horst: *See—*
Spielau, Paul; Vohwinkel, Horst; and Kuhnel, Werner, 4,371,654, Cl. 524-296.000.

Voisin, Max. Process for lowering the freezing point of anise essences and anethole by natural products. 4,371,559, Cl. 426-538.000.

Volcovici, David. Electric dispatchers. 4,371,761, Cl. 200-27.0BA.

Voles, Roger, to E M I Limited. Aiming arrangements. 4,370,914, Cl. 89-41.0TV.

Volling, Axel: *See—*
Aichelmann, Dietmar; Kannenberg, Karl; Schutte, Dieter; and Volling, Axel, 4,371,503, Cl. 422-307.000.

Volz, William A.: *See—*
Troemner, James O.; Wetrich, Peter D.; and Volz, William A., 4,371,063, Cl. 192-4.00A.

von Bennigsen-Mackiewicz, Andreas; and von Bennigsen-Mackiewicz, Christoph. Production of powdered sugar. 4,371,117, Cl. 241-18.000.

von Bennigsen-Mackiewicz, Christoph: *See—*
von Bennigsen-Mackiewicz, Andreas; and von Bennigsen-Mackiewicz, Christoph, 4,371,117, Cl. 241-18.000.

Von Genk, Richard A.: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,371,722, Cl. 568-828.000.

von Kempski, Walter; and Kirstein, Fritz, to Agfa-Gevaert Aktiengesellschaft. Security filament as protection against fraud. 4,371,196, Cl. 283-7.000.

von Obstfelder, Nikalous. Buoyant soap holder. 4,371,140, Cl. 248-359.000.

von Schneidemesser, Christian; Nowotka, Paul G.; and Rudel, Gerhard, to Wolters, Peter. Working pressure control mechanism. 4,370,835, Cl. 51-165.770.

von Tell, Bjorn R. L. Method and means to fill out uneven surfaces, for example in block boards. 4,371,568, Cl. 427-140.000.

von Werner, Konrad: *See—*
Knoblauch, Wolfgang; and von Werner, Konrad, 4,371,448, Cl. 252-78.100.

Vorozheikin, Anatoly A.: *See—*
Mitin, Leonid A.; Mitrofanov, Vladislav V.; Fadeev, Vladimir Y.; Fadeev, Petr Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; Vorozheikin, Anatoly A.; Ermilov, Nikolai P.; Smirnov, Jury V.; and Besedin, Ivan A., 4,370,916, Cl. 91-173.000.

Vorwerk & Sohn GmbH & Co. KG: *See—*
Stein, Hermann; and Piepenbrink, Ulrich, 4,371,024, Cl. 152-158.000.

Vos, Geert H., to Noordvos Schroeven B.V. Propeller for distributing a gaseous, powdered or liquid material in a liquid. 4,371,480, Cl. 261-87.000.

W. R. Grace & Co.: *See—*
Fusee, Murray C., 4,371,611, Cl. 435-14.000.
Heffernan, Peter C., 4,371,330, Cl. 425-458.000.
Sanchez, Moises G.; and Laine, Norman R., 4,371,513, Cl. 423-625.000.

Wada, Kunihiko: *See—*
Ikubo, Hiroyuki; and Wada, Kunihiko, 4,371,403, Cl. 148-1.500.

Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser. 4,371,967, Cl. 372-45.000.

Wada, Satomi, to Aisan Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,371,478, Cl. 261-44.00C.

Wagner, Hans: *See—*
Quiring, Bernd; Niederdellmann, Georg; Goyert, Wilhelm; and Wagner, Hans, 4,371,684, Cl. 528-65.000.

Wagner, Johann: *See—*
Skatsche, Othmar; Wagner, Johann; and Obermayer, Bertram, 4,370,957, Cl. 123-196.0AB.

Wagner, Robert J., to Allis-Chalmers Corporation. Self-aligning vehicle door hinges. 4,370,829, Cl. 49-388.000.

Wagner, Rudolf, to Rems-Werk Christian Foll und Sohne GmbH & Co. Cutting head for thread cutting machines. 4,370,770, Cl. 10-96.00R.

Wagner, Walter R.; and Duda, Richard M., to UOP Inc. Vent cap assembly for a monitoring well. 4,370,919, Cl. 98-122.000.

Wagner, Wolfgang, to U.S. Philips Corporation. X-Ray apparatus for determining the absorption distribution in a flat examination zone. 4,371,976, Cl. 378-16.000.

Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, to Robert Bosch GmbH. Vehicle trip computer. 4,371,934, Cl. 364-424.000.

Wakabayashi, Masayoshi; and Taniguchi, Matsuyoshi, to Dainippon Screen Manufacturing Co., Ltd. Developing processor for printing plates having a spray tube developer agitator. 4,371,250, Cl. 354-325.000.

Waldstrom, Ejvind: *See—*
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Walker, Cuthbert J.: *See—*
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Walker, Harry S., Jr.: *See—*
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Wallis, Christopher J.: *See—*
Collington, Eric W.; Hallet, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,371,530, Cl. 424-244.000.

Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Intermediates to produce imidazodiazepines. 4,371,468, Cl. 260-239.0BD.

Walsh, Thomas C., to United Technologies Corporation. Compression section for an axial flow rotary machine. 4,371,311, Cl. 415-182.000.

Walters, John O.: *See—*
Bard, William B.; and Walters, John O., 4,371,499, Cl. 422-111.000.

Walther, William D., to Dayton-Walther Corporation. Edge lugged tire carrying rim and wheel. 4,371,213, Cl. 301-12.00R.

Wanchik, Joseph; and Gabriele, Joseph M., to Contour Fabricators, Inc. Dynamic foam orthosis. 4,370,976, Cl. 128-77.000.

Wang, James C.; Murfitt, Donald; Livingston, Paul H.; and Joson, Luis K., to General Binding Corporation. Universal binding for making variable sized books and reports. 4,371,194, Cl. 281-21.00R.

Wang, James C.; Murfitt, Donald; and Livingston, Paul H., to General Binding Corporation. Cover with adhesive bridges in scored areas. 4,371,195, Cl. 281-21.00R.

Ward, Richard M.: *See—*
Abernathy, William L.; Bertram, Billy B.; Davis, Anthony D.; and Ward, Richard M., 4,371,038, Cl. 166-380.000.

Warner, Joshua B.; and Wolf, James S., to Warner London Inc. Process for depositing protective coating and articles produced. 4,371,589, Cl. 428-553.000.

Warner London Inc.: *See—*
Warner, Joshua B.; and Wolf, James S., 4,371,589, Cl. 428-553.000.

Washer, Stone P., to Phillips Petroleum Company. Alkylation process. 4,371,731, Cl. 585-716.000.

Wasserman, Gary L.: *See—*
Karr, Lawrence J.; Wasserman, Gary L.; and Boehme, George R., 4,371,945, Cl. 364-561.000.

Wasserman, Gary Lee: *See—*
Karr, Lawrence J.; Wasserman, Gary L.; and Boehme, George R., 4,371,945, Cl. 364-561.000.

Watanabe, Kazuhiro: *See—*
Hisatsugu, Kaji; and Watanabe, Kazuhiro, 4,371,454, Cl. 252-422.000.

Watanabe, Kazutomi; Iwasaki, Sokichi; and Baba, Nobuyuki, to Shin Nippon Koki Co., Ltd. Apparatus for painting containers. 4,370,943, Cl. 118-218.000.

Watanabe, Kenkichi, to Laurel Bank Machine Co., Ltd. Coin counting and stopping apparatus for use in a coin handling machine. 4,370,990, Cl. 133-8.00A.

Watanabe, Kiyoshi: *See—*
Ohashi, Takehisa; Shimazaki, Masami; Kan, Kazunori; Kondo, Hideo; and Watanabe, Kiyoshi, 4,371,699, Cl. 548-201.000.

Watanabe, Koji, to Nifco Inc. Tape reel. 4,371,123, Cl. 242-71.800.

Watanabe, Toshihiko; Takeuchi, Naoki; Tsuruga, Soichi; and Koishi, Tadatsugu, to Kobe Steel, Ltd. Welding machine. 4,371,107, Cl. 228-32.000.

Watts, Warren G. Method of covering surfaces with tensile sheet materials. 4,370,792, Cl. 29-407.000.

Weatherford U.K. Limited: *See—*
Lovegrove, Peter J., 4,371,069, Cl. 192-135.000.

Webb, Thomas H.; Vest, Hugh F.; and Chan, Keng S., to Standard Oil Company. Low viscosity water-in-oil microemulsions. 4,371,447, Cl. 252-73.000.

Webber, Gloria C. Envelope for a bed having side rails. 4,370,765, Cl. 5-427.000.

Weber, Klaus: *See—*
Oberstrass, Detley; Hartig, Wolfgang; and Weber, Klaus, 4,370,852, Cl. 57-340.000.

Weible, Karl-Heinz, to Sandoz Ltd. Simultaneous de-sizing and reactive dyeing of cellulose textiles. 4,371,372, Cl. 8-543.000.

Weigl, Andreas: *See—*
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Weimer, Charles M., to Pitney Bowes Inc. Apparatus for interconnecting an actuator and a postage meter. 4,371,781, Cl. 235-101.000.

Weinberger, Theodore, to Adriel Energy Corporation. Fuel additive. 4,371,377, Cl. 44-56.000.

Weinrauch, David. Hair styling accoutrements. 4,371,084, Cl. 211-126.000.

Weinzierl, Klaus; and Karger, Robert, to L. & C. Steinmuller GmbH. Method for operating a flue gas desulfurization. 4,371,508, Cl. 423-242.000.

Weinzierl, Werner: *See—*
Steinicke, Wolfgang; Badura, Wolfgang; Schiessl, Alois; Weinzierl, Werner; and Krone, Hartmut, 4,370,929, Cl. 102-202.000.

Weiperth, Vilmos; and Lezsak, Tibor, to Chemokomplex Vegyipari Gepes Berendezes Export Import Vallalat. Spraying gun. 4,371,114, Cl. 239-309.000.

Weisbach, Gunter; Lucius, Gunter; and Plage, Dieter, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Sheet feu rotary press having an auxiliary gripper system arranged below a feeding cylinder. 4,370,928, Cl. 101-242.000.

Weiss, Hermann: *See—*
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.

Welsh, James K.: *See—*
Barnes, Derek; Churchland, Mark T.; Herndier, Arnold W.; Schilling, Walter W.; and Welsh, James K., 4,371,020, Cl. 144-366.000.

Welzel, Gerhard: *See—*
Distler, Dieter; Wolf, Hans; and Welzel, Gerhard, 4,371,636, Cl. 523-223.000.

Weresch, Thomas. Apparatus for working leads of electrical components. 4,371,012, Cl. 140-105.000.

Wergen, Thomas E.: *See—*
Faccini, Ernest C.; and Wergen, Thomas E., 4,371,771, Cl. 219-70.000.

Wessa, Theo. Method and apparatus for cooling heated gases or liquids. 4,370,864, Cl. 62-98.000.

West Electric Company, Ltd.: *See—*
Iwata, Hiroshi; Yoshino, Tsunemi; Kashihara, Toshitsugu; and Morioka, Akitoshi, 4,371,245, Cl. 354-198.000.

Western Electric Company, Inc.: *See—*
Camp, Carey A., 4,371,013, Cl. 140-147.000.

Westinghouse Canada Inc.: *See—*
Bignell, Allan M., 4,371,907, Cl. 361-82.000.

Westinghouse Electric Corp.: *See*—
Corth, Richard, 4,371,810, Cl. 313-487.000.
Lawson, Charles A., II; and Dufek, Wayne L., 4,371,496, Cl. 376-258.000.
Marlatt, George R., 4,371,495, Cl. 376-209.000.
McCaskey, Harold O.; and Benson, Melvin E., 4,371,579, Cl. 428-204.000.
Murphy, John J.; Petro, John; and Unglert, Melvin C., 4,371,224, Cl. 316-32.000.
Niehenke, Edward C.; Klein, Gerald I.; and Linsenbardt, Aldo E., 4,371,851, Cl. 333-17.00L.
Salowe, Seymour; and Zinchuk, Thomas C., 4,371,829, Cl. 323-209.000.
Westman, Erik: *See*—
Larsson, Hans G.; and Westman, Erik, 4,371,396, Cl. 419-56.000.
Wetrich, Peter D.: *See*—
Troemner, James O.; Wetrich, Peter D.; and Volz, William A., 4,371,063, Cl. 192-4.00A.
White, Charles C., Jr.: *See*—
Jones, Johnny O., Jr.; and White, Charles C., Jr., 4,371,815, Cl. 318-114.000.
Whittingham, David J.: *See*—
Sankey, Edwin W.; and Whittingham, David J., 4,371,086, Cl. 212-253.000.
Widmayer, Don F., to Controlled Environment Systems, Inc. Light regulation system. 4,371,812, Cl. 315-291.000.
Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Steinbeck, Hermann, 4,371,529, Cl. 424-243.000.
Wieland, Dieter: *See*—
Schurr, Volker; Nickel, Hans; Hoppner, Klaus; Kohler, Gisbert; Weiss, Hermann; and Wieland, Dieter, 4,370,810, Cl. 30-382.000.
Wieser, Alfred. Control circuit for an ultrasonic dental scaler. 4,371,816, Cl. 318-116.000.
Wijnhoven, Rene M. G.: *See*—
Mulder, Cornelis; Nederlof, Leendert; Niessen, Cornelis; Wijnhoven, Rene M. G.; and Salters, Roelof H. W., 4,371,795, Cl. 307-440.000.
Wilcox, Raymond J.; and Powers, Earl W. Mine roof bearing plate. 4,371,293, Cl. 405-259.000.
Wilhelm Hegenscheidt Gesellschaft mbH: *See*—
Berstein, Garri; and Riedel, Walter, 4,371,296, Cl. 407-115.000.
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., to Honeywell Information Systems Inc. Data processing system programmable pre-read capability. 4,371,927, Cl. 364-200.000.
Wilking, Hans; and Kafitz, Egon, to Keiper Automobiltechnik GmbH & Co. KG. Position adjuster for motor vehicle seats and windows. 4,371,207, Cl. 297-348.000.
Wilkinson, Alan: *See*—
Alford, Derek; and Wilkinson, Alan, 4,371,209, Cl. 299-1.000.
Williams, James F. Flow-controlled injector system. 4,370,996, Cl. 137-99.000.
Williams, Raymond L., to United States of America, Air Force. Fuel valve. 4,370,854, Cl. 60-261.000.
Williams, Sidney J.: *See*—
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,370,997, Cl. 137-116.300.
Williams, Victor N. Ankle and foot exercise apparatus. 4,371,161, Cl. 272-96.000.
Willig, Roy L.; LeBlanc, Edward J., III; and Airhart, Harold, Sr., to CRC Wireline, Inc. Simultaneous multigun high density multiphase perforating unit. 4,371,044, Cl. 175-4.600.
Willy A. Bachofen AG: *See*—
Leuthold, Albert, 4,371,119, Cl. 241-66.000.
Wilson, Gerald L.; and Otten, David. DC Ground fault detector wherein fault is sensed by noting imbalance of magnetic flux in a magnetic core. 4,371,832, Cl. 324-51.000.
Wilson, Leon R. Bale wagon. 4,370,796, Cl. 29-564.300.
Wilson, Michael T. Method of forming an adjustable prosthetic element. 4,370,791, Cl. 29-407.000.
Winbigler, Paul H., to Kuhlman Corporation. Spring assembly and method for manufacture thereof. 4,371,154, Cl. 267-179.000.
Windmoller & Holscher: *See*—
Achelpohl, Fritz; and Decker, Werner, 4,371,367, Cl. 493-256.000.
Feldkamper, Richard, 4,370,787, Cl. 29-124.000.
Mundus, Friedhelm, 4,371,413, Cl. 156-349.000.
Winkler, Klaus: *See*—
Marx, Karl; Winkler, Klaus; Schmidt, Kurt; and Jentzsch, Joachim, 4,371,158, Cl. 271-103.000.
Winn, Jackie L., to Union Carbide Corporation. Welding power supply. 4,371,776, Cl. 219-130.510.
Winter, Gerhard: *See*—
Hohn, Richard; Jung, Werner; Winter, Gerhard; and Woerner, Siegfried, 4,371,879, Cl. 346-135.100.
Wintergerst, Siegfried: *See*—
Markfeld, Udo; and Wintergerst, Siegfried, 4,370,896, Cl. 74-339.000.
Wirt, Leslie S., to Lockheed Corporation. Flow duct sound attenuator. 4,371,054, Cl. 181-252.000.
Wirz, John H.: *See*—
Baxter, Duane W.; Evjen, Joseph L., Jr.; Hoveland, William C.; Roble, Roy A.; Smith, Donald R.; and Wirz, John H., 4,371,902, Cl. 360-75.000.
Witte, Wolfgang W. F., to Bodenseewerk Perkin-Elmer & Co., GmbH. Double monochromator. 4,371,263, Cl. 356-333.000.
Wladimiroff, Wladimir: *See*—
Bator, Tadeusz, 4,371,917, Cl. 363-21.000.
WNY Hospital Television, Inc.: *See*—
Vesterling, Friedrich, 4,371,979, Cl. 455-180.000.
Woerner, Siegfried: *See*—
Hohn, Richard; Jung, Werner; Winter, Gerhard; and Woerner, Siegfried, 4,371,879, Cl. 346-135.100.
Woerwag, Peter, to Duepro AG. Electric motor control for vacuum cleaner. 4,370,777, Cl. 15-339.000.
Wolf, Hans: *See*—
Distler, Dieter; Wolf, Hans; and Welzel, Gerhard, 4,371,636, Cl. 523-223.000.
Wolf, James S.: *See*—
Warner, Joshua B.; and Wolf, James S., 4,371,589, Cl. 428-553.000.
Wolfe, James R., Jr., to Du Pont de Nemours, E. I., and Company. Elastomeric polyetheresterimides. 4,371,692, Cl. 528-289.000.
Wolfe, James R., Jr., to Du Pont de Nemours, E. I., and Company. Thermoplastic elastomeric polyetheresterimides. 4,371,693, Cl. 528-292.000.
Wolters, Peter: *See*—
von Schneidemesser, Christian; Nowotka, Paul G.; and Rudel, Gerhard, 4,370,835, Cl. 51-165.770.
Wood, Steven G.: *See*—
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,371,537, Cl. 424-263.000.
Woods, Eugene L.; and Magnuson, Gustav D., to General Dynamics Corporation/Convair Div. External means for detecting normal zones in superconducting magnets or coils. 4,371,943, Cl. 364-481.000.
Woodward, Clifford S., to Rolls Royce Limited. Reversible thrust ducted fan propulsion unit. 4,371,132, Cl. 244-53.00B.
Worthington, Peter: *See*—
Parfree, Colin S.; and Worthington, Peter, 4,371,234, Cl. 350-96.230.
Woss, Gerhard; and Schreiber, Erich, to List, Hans. Operational testing device for inlet valves and outlet valves of reciprocating engines. 4,370,884, Cl. 73-117.300.
Wright, David M., to British Gas Corporation. Friction drive wheels. 4,370,895, Cl. 74-216.000.
Wright, Edward S. Apparatus promoting flow of a body fluid in a human limb. 4,370,975, Cl. 128-64.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., to United Technologies Corporation. Automatic airspeed engage/disengage. 4,371,938, Cl. 364-434.000.
Wright, Stuart C.: *See*—
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,936, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,937, Cl. 364-434.000.
Adams, Don L.; Fischer, William C.; Wright, Stuart C.; and Verzella, David J., 4,371,939, Cl. 364-434.000.
Wright, Vester L., III, to Franklin Corrugated Design, Inc. Automatic register system for die cutting operations. 4,371,369, Cl. 493-373.000.
Wu, Margaret M., to Mobil Oil Corporation. Selective cracking of disubstituted benzenes having polar substituents. 4,371,721, Cl. 568-750.000.
Wuhrer, Wolfgang: *See*—
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Wust, Willi: *See*—
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Wyler, Siegfried: *See*—
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Beery, Jack, 4,371,254, Cl. 355-8.000.
Ciccarelli, Roger N., 4,371,601, Cl. 430-110.000.
Kramer, Charles J., 4,371,897, Cl. 358-294.000.
Mitrovich, Svetislav; and Beaty, Ronald L., 4,371,276, Cl. 400-625.000.
Schank, Richard L.; and Marsh, Dana G., 4,371,600, Cl. 430-56.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,371,966, Cl. 372-45.000.
Yabuuchi, Takahiro: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Hosina, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,371,544, Cl. 424-322.000.
Yamachika, Hiroshi: *See*—
Saito, Kenji; and Yamachika, Hiroshi, 4,371,711, Cl. 568-310.000.
Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, to Amano Pharmaceutical Co., Ltd. Microbial polyamine oxidase AT-1. 4,371,621, Cl. 435-191.000.
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, to Hisaka Works, Limited. Plate type evaporator. 4,371,034, Cl. 165-108.000.
Yamada, Minoru: *See*—
Toyoda, Takashi; Itoh, Isamu; and Yamada, Minoru, 4,371,610, Cl. 430-445.000.
Yamada, Ryuji: *See*—
Ito, Keishi; and Yamada, Ryuji, 4,370,856, Cl. 60-389.000.
Yamada, Shinji: *See*—
Miyasaka, Hiroshi; and Yamada, Shinji, 4,371,268, Cl. 368-82.000.
Yamada, Yasuhiro, to Victor Company of Japan, Ltd. Block signal forming digital processor with error correction. 4,371,270, Cl. 371-38.000.

Yamagishi, Ryozo: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Yamagishi, Yoshitaka: *See*—
Miyamoto, Akira; Maeda, Masayoshi; and Yamagishi, Yoshitaka, 4,371,675, Cl. 525-472.000.

Yamaguchi, Tokio: *See*—
Nagatsu, Toshiharu; Kato, Takeshi; Yamaguchi, Tokio; Akino, Miki; Matsuura, Sadao; and Sugimoto, Takashi, 4,371,514, Cl. 424-1.000.

Yamaguchi, Toshio: *See*—
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,370,764, Cl. 4-443.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kimpara, Akiyoshi, 4,370,998, Cl. 137-264.000.

Yamaki, Kiyoshi, to Nissan Motor Company, Limited. Navigation instrument. 4,371,935, Cl. 364-424.000.

Yamaki, Kiyoshi; Mizote, Masanori; Takeda, Hitoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; Kawasaki, Teruo; and Mori, Kazuyuki, to Nissan Motor Co., Ltd. Navigation instrument. 4,371,940, Cl. 364-444.000.

Yamamichi, Masayoshi: *See*—
Ohara, Tsunemasa; and Yamamichi, Masayoshi, 4,371,594, Cl. 429-97.000.

Yamamoto, Noboru; and Yamashita, Iwao, to Agency of Industrial Science & Technology Ministry of International Trade & Industry. Antithrombogenic, highly elastic polyurethane compound. 4,371,686, Cl. 528-76.000.

Yamamuro, Koichi: *See*—
Ojima, Juji; and Yamamuro, Koichi, 4,371,360, Cl. 474-111.000.

Yamane, Ken, to Nissan Motor Company, Ltd. Floating bush and outer bearing structure for mounting a shaft in a body rotatably. 4,371,219, Cl. 384-291.000.

Yamano, Kiyoichi: *See*—
Hasegawa, Kazumasa; Ito, Minao; Sugiura, Saburo; Yamano, Kiyoichi; and Hayakawa, Shizunori, 4,371,392, Cl. 75-10.00R.

Yamashita, Iwao: *See*—
Yamamoto, Noboru; and Yamashita, Iwao, 4,371,686, Cl. 528-76.000.

Yamashita, Sadahiko: *See*—
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,371,853, Cl. 333-204.000.

Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Okamoto, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Input/output information indication system. 4,371,926, Cl. 364-200.000.

Yamazaki, Akihiro: *See*—
Utagawa, Takashi; Miyoshi, Takeshi; Morisawa, Hirokazu; Yamazaki, Akihiro; Yoshinaga, Fumihiro; and Mitsugi, Koji, 4,371,613, Cl. 435-88.000.

Yanagisawa, Takao; and Tanaka, Meguru, to Showa Kagaku Kogyo Company, Ltd. 1,4-Bis-styryl-benzene derivatives and a process for the preparation of the same. 4,371,475, Cl. 260-512.00R.

Yanmar Diesel Engine Co., Ltd.: *See*—
Asao, Tomohiro; and Takahashi, Yosuke, 4,370,954, Cl. 123-182.000.

Yasuda, Kazumi: *See*—
Suzuki, Yasuo; Nagata, Shuji; and Yasuda, Kazumi, 4,370,910, Cl. 83-876.000.

Yasuda, Kenji: *See*—
Matsumoto, Shuichi; Yasuda, Kenji; Endoh, Masayuki; and Harada, Kunihiro, 4,371,713, Cl. 568-614.000.

Yasumatsu, Jun: *See*—
Tsuge, Hiroshi; Kawaharazaki, Takashi; and Yasumatsu, Jun, 4,371,126, Cl. 242-107.200.

Yinger, Robert J.: *See*—
Henthorne, Michael; Yinger, Robert J.; and DeBold, Terry A., 4,371,394, Cl. 75-128.00A.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Gain control circuit for pulse width modulation amplifier. 4,371,840, Cl. 330-10.000.

Yoshida, Hiromichi: *See*—
Ando, Toshinari; Nishi, Masataka; Shimamoto, Susumu; Yoshida, Hiromichi; Suzumura, Takashi; Kakizaki, Kimio; Yamagishi, Ryozo; and Ogata, Hisanao, 4,371,741, Cl. 174-15.00S.

Yoshida Kogyo K K: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Masanobu: *See*—
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Yoshimoto, Takeshi; Hiraoka, Hideki; Okazaki, Seiji; Taniguchi, Yoshihiro; and Harada, Tsutomu, to Dainippon Screen Seizo Kabushiki Kaisha. Method for setting up highlight and shadow point density values of original pictures to a picture reproducing machine. 4,371,260, Cl. 355-77.000.

Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, to Matsushita Electric Industrial Co., Ltd. Microwave heating apparatus. 4,371,769, Cl. 219-10.55F.

Yoshimura, Shigeru; and Shimizu, Katsuichi, to Canon Kabushiki Kaisha. Apparatus for handling an original and a recording sheet in a recording device. 4,371,256, Cl. 355-14.0SH.

Yoshinaga, Fumihiro: *See*—
Utagawa, Takashi; Miyoshi, Takeshi; Morisawa, Hirokazu; Yamazaki, Akihiro; Yoshinaga, Fumihiro; and Mitsugi, Koji, 4,371,613, Cl. 435-88.000.

Yoshinaga, Hisashi: *See*—
Takeuchi, Osamu; Kokubun, Haruo; Yoshinaga, Hisashi; Hara, Shuichi; and Ban, Hiromichi, 4,371,149, Cl. 266-90.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu; Kishi, Takao; and Hinokiyama, Minoru, 4,371,098, Cl. 222-321.000.

Yoshino, Tsunemi: *See*—
Iwata, Hiroshi; Yoshino, Tsunemi; Kashihara, Toshitsugu; and Morioka, Akitoshi, 4,371,245, Cl. 354-198.000.

Yoshioka, Takao: *See*—
Soma, Nobuo; Moromura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,371,644, Cl. 524-102.000.

Yoshizawa, Kiyoshi; Otsuka, Kenichi; Nojiro, Kikuo; Koizumi, Takeo; Mitsutomi, Katsuyoshi; and Nakamura, Seiji, to National Tax Administration Agency; and Toh Zinc Company Limited. Method of treating a waste water rich in protein. 4,371,440, Cl. 210-601.000.

Yoshizawa, Rokuro; and Shinozaki, Satoshi, to VLSI Technology Research Association. Method of manufacturing semiconductor device utilizing a lift-off technique. 4,371,423, Cl. 156-653.000.

Yosimura, Yosikazu, to Hirose Electric Co., Ltd. Electric connector. 4,371,227, Cl. 339-211.000.

Yost, Richard J.: *See*—
Bisbee, Charles B.; and Yost, Richard J., 4,370,840, Cl. 52-410.000.

Yost, Thomas D., to RCA Corporation. Chrominance signal processor. 4,371,891, Cl. 358-31.000.

Younes, Usama E., to Atlantic Richfield Company. Thermoplastic molding composition. 4,371,672, Cl. 525-391.000.

Young, Lewis B., to Mobil Oil Corporation. Preparation of 4-alkylanisoles and phenols. 4,371,714, Cl. 568-628.000.

Young, Vern R.: *See*—
Martin, Verble C.; and Forestal, Robert J., 4,370,842, Cl. 52-514.000.

Younkin, James R., to Edo-Aire Mitchell. Navigation instrument. 4,370,815, Cl. 33-318.000.

Zabler, Erich: *See*—
Wahl, Josef; Schmidt, Peter-Jurgen; Birmelin, Jorg; Grob, Ferdinand; Kohler, Rolf; Zabler, Erich; Heintz, Frieder; Bremer, Wolfgang; Kopernick, Viktor; Hugel, Robert; Weigl, Andreas; and Baumann, Gunther, 4,371,934, Cl. 364-424.000.

Zafferri, Roberto: *See*—
Laesser, Claude; Zafferri, Roberto; and Depery, Jean, 4,371,821, Cl. 318-696.000.

Zaha, Juergen H.: *See*—
Choudhury, Hrishikesh; and Zaha, Juergen H., 4,370,992, Cl. 134-100.000.

Zahir, Abdul-Cader; and Wyler, Siegfried, to Ciba-Geigy Corporation. Curable mixtures based on maleimides and propenyl-substituted phenols, and the use thereof. 4,371,719, Cl. 568-723.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Markfeld, Udo; and Wintergerst, Siegfried, 4,370,896, Cl. 74-339.000.
Tischer, Werner, 4,371,002, Cl. 137-625.300.

Zahnradfabrik Friedrichshafen A.G.: *See*—
Goeft, Manfred; and Maurer, Dieter, 4,371,049, Cl. 180-255.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Junichi, 4,371,412, Cl. 156-345.000.

Zaiko, Edward J.; and Ranken, Paul F., to Ethyl Corporation. Preparation of 2-(2-fluoro-4-biphenylyl)propionic acid and corresponding nitride. 4,371,473, Cl. 260-465.00G.

Zaitsev, Ivan I.: *See*—
Sysolin, Petr V.; Zaitsev, Ivan I.; Pekerman, Gary M.; Kurzov, Jury P.; Tompakov, Alexandr E.; Maljuchenkov, Valery A.; and Kabachenko, Alexandr S., 4,371,004, Cl. 137-899.000.

Zambelli, Alessio, to VE.DA. S.r.l. Closed-circuit condensation purifier for gaseous flows containing solvents and moisture. 4,370,816, Cl. 34-76.000.

Zanasi Nigris S.p.A.: *See*—
Cane, Alessandro, 4,371,014, Cl. 141-91.000.
Cane, Alessandro; and Farneti, Arrigo, 4,371,101, Cl. 222-636.000.

Zarrelli, Neal; Bocassi, Joseph V.; and Miller, Robert S., to Zarrelli, Neal. Propane automotive feed system. 4,370,969, Cl. 123-525.000.

Zavody tazkeho strojarstva, narodni podnik: *See*—
Turza, Jozef; Kilik, Ondrej; and Rusnak, Jan, 4,371,217, Cl. 308-5.00R.

Zeiser, Manfred P. Denture mold, and method of and arrangement for its manufacture. 4,371,339, Cl. 433-74.000.

Zeitraeg, Rolf, to Siemens Aktiengesellschaft. Circuit arrangement for compensating phase differences of non-synchronous clock pulse rates of a telecommunication system. 4,371,962, Cl. 370-100.000.

Zeller, Hans: *See*—
Bube, Carsten; Dull, Ernst H.; Thiele, Gerd; and Zeller, Hans, 4,371,910, Cl. 361-106.000.

Zera, Robert D.: *See*—
Silverman, Gary S.; Zera, Robert D.; Kubiatowicz, James F.; and Claussen, Robert L., 4,371,171, Cl. 273-357.000.

Zide, Robert, to Pro-Line, Inc. Face guard mount for helmets. 4,370,759, Cl. 2-424.000.

Zinchuk, Thomas C.: *See*—
Salowe, Seymour; and Zinchuk, Thomas C., 4,371,829, Cl. 323-209.000.

Zingrini, Carlo; and Oreglio, Maurizio, to Telettra-telefonia Elettronica e Radio S.p.A. Universal rack for housing telecommunication equipment. 4,371,083, Cl. 211-26.000.

Zinser-Textilmaschinen GmbH: *See*—
Feiler, Horst; and Konig, Gunter, 4,371,121, Cl. 242-18.0DD.

Zipoy, William L.: *See*—
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Jackson, Timothy; and Zipoy, William L., 4,371,932, Cl. 364-200.000.
Zobel, Frederick A.: *See*—
Pitchon, Ezra; Schara, Robert E.; Citarella, William P.; Giacone, Joseph; and Zobel, Frederick A., 4,371,556, Cl. 426-311.000.
Zohler, Steven R.: *See*—
May, John E.; and Zohler, Steven R., 4,371,860, Cl. 338-21.000.
Zonnenberg, Ilya S.: *See*—
Kopysky, Boris D.; Dmitriev, Viktor D.; Khaustov, Georgy I.; Brodsky, Viktor M.; Surzhikov, Vitaly A.; Semenov, Evgeny I.; Chus, Vladimir G.; Miajulya, Viktor A.; Kandyba, Leonid F.; Ivanov, Igor P.; Bezzub, Grigory I.; Goldenberg, Yasha F.; Zonnenberg, Ilya S.; Paly, Alexandr G.; and Malkin, Arkady S., 4,370,879, Cl. 72-377.000.
Zysman, Alexandre: *See*—
Vanlerberghe, Guy; Sebag, Henri; Zysman, Alexandre; and Dubief, Claude, 4,371,517, Cl. 424-70.000.
100426 Canada Ltee.: *See*—
Blier, Daniel, 4,371,057, Cl. 182-184.000.

LIST OF REISSUE PATENTEES

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PATENTS WERE ISSUED ON THE 1ST DAY OF FEBRUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ahlgren, Carl R., to Allied Corporation. Manufacture of malic acid. Re. 31,139, Cl. 562-582.000.

Allied Corporation: *See*—
Ahlgren, Carl R., Re. 31,139, Cl. 562-582.000.

American Can Company: *See*—
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, Re. 31,137, Cl. 156-244.110.

Baxter Travenol Laboratories, Inc.: *See*—
Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., Re. 31,135, Cl. 150-8.000.

FMC Corporation: *See*—
Treves, Gino R., Re. 31,136, Cl. 71-92.000.

Martin, Jerry D.: *See*—
Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., Re. 31,135, Cl. 150-8.000.

Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, to American Can Company. Pouch. Re. 31,137, Cl. 156-244.110.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru, Re. 31,138, Cl. 156-473.000.

Roe, Frank L.: *See*—
Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., Re. 31,135, Cl. 150-8.000.

Tokuno, Masateru, to Rengo Co., Ltd. Single facer for manufacturing single-faced corrugated board. Re. 31,138, Cl. 156-473.000.

Treves, Gino R., to FMC Corporation. Herbicidal 5-pyrimidinecarbonitriles. Re. 31,136, Cl. 71-92.000.

Warmbier, Henry: *See*—
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, Re. 31,137, Cl. 156-244.110.

Wildenberg, Thomas S.: *See*—
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, Re. 31,137, Cl. 156-244.110.

Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., to Baxter Travenol Laboratories, Inc. Flexible collapsible containers, and method of molding. Re. 31,135, Cl. 150-8.000.

LIST OF REEXAMINATION PATENTEES

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CERTIFICATES WERE ISSUED

Amway, Allen R., to Plaunt & Anderson Company, Inc. Method and apparatus for detecting and locating fluid leaks. B1 4,083,229, Cl. 73—40.5 A.

Plaunt & Anderson Company, Inc.: *See*—
Amway, Allen R. B1 4,083,229, Cl. 73—40.5 A.

Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., to Auto-Systems and Services, Inc. B1 4,173,910, Cl. 83—29.

Auto-Systems and Services, Inc.: *See*—
Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W. B1 4,173,910, Cl. 83—29.

Theeuwes, Felix; Damani, Nalinkant C., to Alza Corporation. Osmotically driven active agent dispenser. B1 4,016,880, Cl. 128—260.

Alza Corporation: *See*—
Theeuwes, Felix; Damani, Nalinkant C. B1 4,016,880, Cl. 128—260.

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A-Teknik Alf Sundberg Aktiebolag: *See*—
Sundberg, Alf H., 267,764, Cl. D6-246.000.

Abbott Laboratories: *See*—
Gross, James R., 267,827, Cl. D32-51.000.

Aladdin Industries, Incorporated: *See*—
Storrs, Harold W., 267,766, Cl. D7-38.000.
Storrs, Harold W., 267,767, Cl. D7-38.000.

Allibert S.A.: *See*—
Vrignaud, Guy, 267,760, Cl. D6-97.000.

Amerock Corporation: *See*—
Pittenger, Teresa R. B., 267,774, Cl. D8-317.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Portable electronic typewriter. 267,805, 2-1-83, Cl. D18-1.000.

Birns, Jack. Combined industrial diver's underwater light and ultraviolet inspection light. 267,819, 2-1-83, Cl. D26-37.000.

Bluestein, Bernard B.: *See*—
Guth, Gordon T.; Long, Douglas G.; and Bluestein, Bernard B., 267,821, Cl. D28-38.000.

Braun, Eugen. Warning lamp. 267,787, 2-1-83, Cl. D14-114.000.

Bressler, Irving, to Four Paws Products, Ltd. Pet nursing nipple. 267,814, 2-1-83, Cl. D24-46.000.

Bulgari, Marina, to Zoldia Anstalt. Necklace. 267,788, 2-1-83, Cl. D11-5.000.

Burroughs, Robert C. Calendar. 267,807, 2-1-83, Cl. D19-24.000.

C. R. Bard Inc.: *See*—
Elliott, Donald P.; Halseth, William L.; and King, William R., 267,815, Cl. D24-59.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Chain saw case. 267,754, 2-1-83, Cl. D3-72.000.

Cavalli, Alfredo. Dough machine. 267,771, 2-1-83, Cl. D7-376.000.

Chase, Herbert S. Spice rack. 267,762, 2-1-83, Cl. D6-113.000.

Cherry, Isaac R.: *See*—
Dekker, Frank; and Cherry, Isaac R., 267,798, Cl. D14-11.000.

Clark, Karen G. Plaque. 267,791, 2-1-83, Cl. D11-137.000.

Cohen, Leon H. Shoe sole material. 267,828, 2-1-83, Cl. D92-32.000.

Cohen, Piet, to Materias Plasticas, Limitada. Tower rail. 267,761, 2-1-83, Cl. D6-99.000.

Continental Group, Inc., The: *See*—
Roth, Donald J., 267,779, Cl. D9-434.000.
Walter, John, 267,780, Cl. D9-434.000.

Cook, Richard. Vault dome. 267,829, 2-1-83, Cl. D19-12.000.

Cosrich, Inc.: *See*—
Katz, Phillip; and Sonnenblick, Richard, 267,822, Cl. D28-86.000.

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Dornier GmbH: *See*—
Krojer, Hubert, 267,794, Cl. D12-337.000.

Duggan, James E. Combined pasta drying rack and trivet. 267,768, 2-1-83, Cl. D7-76.000.

Dybal, Walter F., to Shelly & Anderson Furniture Mfg. Co., Inc. Sofa. 267,758, 2-1-83, Cl. D6-63.000.

Eddinger, Charles. Pendant. 267,790, 2-1-83, Cl. D11-83.000.

Elliott, Donald P.; Halseth, William L.; and King, William R., to C. R. Bard Inc. Chest drainage bottle. 267,815, 2-1-83, Cl. D24-59.000.

Esaki, Akira; Yamasaki, Tsutomu; and Sakata, Keiji, to Sharp Corporation. Facsimile transceiver. 267,799, 2-1-83, Cl. D14-94.000.

Fairbrother, Peter G., to Glenwood Limited. Combined sun visor and radio receiver. 267,752, 2-1-83, Cl. D2-241.000.

Fielder, Jean C.: *See*—
Litt, Kenneth C.; and Fielder, Jean C., 267,796, Cl. D13-11.000.
Fischer, Karl. Cooking appliance. 267,770, 2-1-83, Cl. D7-346.000.
Four Paws Products, Ltd.: *See*—
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Garrett, Roger G. Tripod ladder. 267,817, 2-1-83, Cl. D25-63.000.
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Grebe, Phillip M. Simulative test. 267,811, 2-1-83, Cl. D21-253.000.
Gringer, Donald. Hand scraper. 267,826, 2-1-83, Cl. D32-48.000.
Gross, James R., to Abbott Laboratories. Sponge applicator, or the like. 267,827, 2-1-83, Cl. D32-51.000.
Guth, Gordon T.; Long, Douglas G.; and Bluestein, Bernard B., to Sunbeam Corporation. Hair curler set. 267,821, 2-1-83, Cl. D28-38.000.
Halseth, William L.: *See*—
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Hankin, Myron I. Drip proof cup. 267,765, 2-1-83, Cl. D7-9.000.
Hans Grohe GmbH & Co. KG: *See*—
Haug, Andreas, 267,812, Cl. D23-35.000.
Haug, Andreas, to Hans Grohe GmbH & Co. KG. Dual shower head. 267,812, 2-1-83, Cl. D23-35.000.
Heimdal, Lowell D., to North Iowa Tool and Die. Shovel. 267,772, 2-1-83, Cl. D8-9.000.
Heuer, Jack W., to Heuer-Leonidas S.A. Stop watch. 267,784, 2-1-83, Cl. D10-30.000.
Heuer, Jack W., to Heuer-Leonidas S.A. Stop watch. 267,785, 2-1-83, Cl. D10-30.000.
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Heuer, Jack W., 267,785, Cl. D10-30.000.
Holcombe, J. L., to Mizell, Emerson H. Insulation support. 267,775, 2-1-83, Cl. D8-380.000.
Holgersson, Lennart; and Mahl, Berne, to Telefonaktiebolaget L M Ericsson. Mounting strip for electric cables or similar articles. 267,776, 2-1-83, Cl. D8-396.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ohba, Yasuhiro, 267,792, Cl. D12-110.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 267,755, 2-1-83, Cl. D4-38.100.
Huck, Joel C. Image frame. 267,763, 2-1-83, Cl. D6-234.000.
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Johnson, Lewis T.: *See*—
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Kalvitis, Robert E., to Xerox Corporation. Continuous paper input module. 267,803, 2-1-83, Cl. D16-32.000.
Kalvitis, Robert E., to Xerox Corporation. Tractor feed module for continuous paper. 267,804, 2-1-83, Cl. D16-32.000.
Katz, Phillip; and Sonnenblick, Richard, to Cosrich, Inc. Double-ended cosmetic case. 267,822, 2-1-83, Cl. D28-86.000.
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Krabeepetcharat, Pramuan, to dellaRobbia Incorporated. Cushioned chair. 267,756, 2-1-83, Cl. D6-47.000.
Krabeepetcharat, Pramuan, to dellaRobbia Incorporated. Cushioned seat. 267,759, 2-1-83, Cl. D6-66.000.
Krojer, Hubert, to Dornier GmbH. Aircraft design. 267,794, 2-1-83, Cl. D12-337.000.
Lang, William J. Cleaner can. 267,783, 2-1-83, Cl. D9-499.000.
Leib, Roger K. Chair. 267,757, 2-1-83, Cl. D6-56.000.
Life Power Products, Inc.: *See*—
Wolf, Charles S., 267,786, Cl. D10-81.000.
Linden, Erkki O., to Oy. Fiskars AB. Scissors. 267,773, 2-1-83, Cl. D8-57.000.
Lippert Corporation: *See*—
Lippert, William L., Jr.; and Lippert, Wayne M., 267,813, Cl. D23-55.000.
Lippert, Wayne M.: *See*—
Lippert, William L., Jr.; and Lippert, Wayne M., 267,813, Cl. D23-55.000.
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Litt, Kenneth C.; and Fielder, Jean C., to Pace Incorporated. Ornamental design for a power supply unit. 267,796, 2-1-83, Cl. D13-11.000.
Long, Douglas G.: *See*—
Guth, Gordon T.; Long, Douglas G.; and Bluestein, Bernard B., 267,821, Cl. D28-38.000.
Lowery, Vernon L.; and Vega, Richard, to Pfeiler & Associates, Engineers, Inc. Clipboard. 267,809, 2-1-83, Cl. D19-88.000.
Lynn, Judith B.: *See*—
Lynn, Robert W.; and Lynn, Judith B., 267,818, Cl. D26-35.000.
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Mallon, William D., to Perrott Engineering Labs, Inc. Battery holder. 267,795, 2-1-83, Cl. D13-10.000.
Mannelly, James P., to Tennant Company. Floor maintenance machine. 267,824, 2-1-83, Cl. D32-16.000.
Materias Plasticas, Limitada: *See*—
Cohen, Piet, 267,761, Cl. D6-99.000.
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Nagata, Toyohiro. Box. 267,778, 2-1-83, Cl. D9-424.000.
Nashua Corporation: *See*—
Plumb, William L.; and Serbinski, Andrew T., 267,801, Cl. D16-30.000.
Niimi, Kenneth; and Simmons, Richard J., to Reed-Union Corporation. Combined packaging and display container. 267,777, 2-1-83, Cl. D9-347.000.
Nippon Paint Co., Ltd.: *See*—
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Ohba, Yasuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Motor tricycle. 267,792, 2-1-83, Cl. D12-110.000.
Orsos, Nicholas M. Combined sign support and clip therefor. 267,810, 2-1-83, Cl. D20-43.000.
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Panter, Charles W. Portable card imprinter. 267,806, 2-1-83, Cl. D18-14.000.
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Pope, Ozell J. Barbeque smoker. 267,769, 2-1-83, Cl. D7-332.000.
Prange, Charles J., to Sewer Rodding Equipment Co. Sewer line proofer tool. 267,823, 2-1-83, Cl. D32-14.000.
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Skidmore, Wilbert L., to Glas-Tek, Inc. Design for a pick-up truck bed enclosure. 267,793, 2-1-83, Cl. D12-156.000.
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Sundberg, Alf H., to A-Teknik Alf Sundberg Aktiebolag. Corner lock for frames. 267,764, 2-1-83, Cl. D6-246.000.
Tate, Jimmy W. Mobile asphalt pavement sealing machine. 267,800, 2-1-83, Cl. D15-13.000.
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Tripp, Donald F. Heat lamp stand. 267,816, 2-1-83, Cl. D24-68.000.

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Winandy, Carol M. Necklace pendant. 267,789, 2-1-83, Cl. D11-81.000.

Wolf, Charles S., to Life Power Products, Inc. Salt meter. 267,786, 2-1-83, Cl. D10-81.000.

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LIST OF PLANT PATENTEES

Wandell, Willet N. Sugar maple tree named Legacy. 4,979, 2-1-83, Cl. 51.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF FEBRUARY, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Cutler, Robert S.; and Fuller, Sterritt R., Jr. Ink jet ink composition. T102,701, 2-1-83, Cl. 524-562.000.

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Cutler, Robert S.; and Fuller, Sterritt R., Jr., T102,701, Cl. 524-562.000.

CLASSIFICATION OF PATENTS

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CLASS 57

71 4,370,849
96 4,370,850
340 4,370,851
4,370,852
4,370,853

CLASS 60

261 4,370,854
317 4,370,855
389 4,370,856
413 4,370,857
641.11 4,370,860
641.5 4,370,858
641.6 4,370,859

CLASS 62

63 4,370,861
66 4,370,862
89 4,370,863
98 4,370,864
124 4,370,865
256 4,370,866
4,370,867
504 4,370,868

CLASS 65

118 4,371,387

CLASS 66

1 A 4,370,870
202 4,370,871

CLASS 68

158 4,370,872

CLASS 70

163 4,370,873
204 4,370,874
422 4,370,875

CLASS 71

90 4,371,388
4,371,389
92 Re.31,136
93 4,371,390
4,371,391

CLASS 72

68 4,370,876
222 4,370,877
345 4,370,878
377 4,370,879
389 4,370,880
402 4,370,881
447 4,370,882

CLASS 73

117 4,370,883
117.3 4,370,884
153 4,370,885
4,370,886
204 4,370,887
580 4,370,888
619 4,370,889
718 4,370,890
861.03 4,370,891
861.12 4,370,892
861.61 4,370,893
40.5 A B1 4,083,229

CLASS 74

87 4,370,894
216 4,370,895
339 4,370,896
475 4,370,897
540 4,370,898
572 4,370,899
574 4,370,900
586 4,370,901
625 4,370,902
858 4,370,903
4,370,904

CLASS 75

10 R 4,371,392
108 4,371,393
128 A 4,371,394
129 4,371,395

CLASS 76

74 4,370,905

CLASS 81

464 4,370,906

CLASS 82

33 R 4,370,907

CLASS 83

348 4,370,908
437 4,370,909
876 4,370,910
29 B1 4,173,910

CLASS 84

280 4,370,911
418 4,370,912

CLASS 86

45 4,370,913

CLASS 89

41 TV 4,370,914
47 4,370,915

CLASS 91

173 4,370,916
491 4,370,917

CLASS 92

163 4,370,918

CLASS 98

122 4,370,919

CLASS 99

339 4,370,920
405 4,370,921
572 4,370,922

CLASS 100

47 4,370,923
189 4,370,924

CLASS 101

40 4,370,925
207 4,370,926
228 4,370,927
242 4,370,928

CLASS 102

202 4,370,929
530 4,370,930

CLASS 104

20 4,370,931

CLASS 105

163 SK 4,370,932
197 DB 4,370,933

CLASS 106

1.23 4,371,397
10 4,371,398
109 4,371,399
273 R 4,371,400
281 R 4,371,401

CLASS 109

1 S 4,370,934
51 4,370,935

CLASS 112

10 4,370,936
79 A 4,370,937
158 E 4,370,938
262.2 4,370,939
286 4,370,940

CLASS 118

13 4,370,941
40 4,370,942
218 4,370,943
302 4,370,944
303 4,370,945

CLASS 119

1 4,370,946
3 4,370,947
72.5 4,370,948

CLASS 122

20 B 4,370,949

CLASS 123

41.08 4,370,950
41.74 4,370,951
41.84 4,370,952
55 VS 4,370,953
182 4,370,954
190 BB 4,370,955
196 AB 4,370,956
4,370,957
4,370,958
4,370,959
4,370,960
4,370,961
4,370,962
4,370,963
4,370,964
4,370,965
426 4,370,966
447 4,370,967
452 4,370,968
488 4,370,969
525 4,370,970
557 4,370,971
573 4,370,972

CLASS 124

23 R 4,370,973
58 4,370,974
439 4,370,975

CLASS 126

60 4,371,402

CLASS 128

64 4,370,975
77 4,370,976
80 C 4,370,978
80 F 4,370,977
303 A 4,370,979
303.17 4,370,980
334 R 4,370,981
630 4,370,983
640 4,370,984
663 4,370,985
716 4,370,986
760 4,370,987
260 B1 4,016,880

CLASS 131

201 4,370,988

CLASS 132

79 B 4,370,989

CLASS 133

8 A 4,370,990

CLASS 134

76 4,370,991
100 4,370,992

CLASS 135

19.5 4,370,993
20 B 4,370,994

CLASS 136

243 4,371,738
251 4,371,739
256 4,371,740

CLASS 137

15 4,370,995
99 4,370,996
116.3 4,370,997
264 4,370,998
270 4,370,999
434 4,371,000
512.3 4,371,001
625.3 4,371,002
625.46 4,371,003
899 4,371,004

CLASS 138

89 4,371,005

CLASS 139

68 4,371,006
348 4,371,008
435 4,371,007
452 4,371,009

CLASS 140

93 A 4,371,010
93.2 4,371,011
105 4,371,012
147 4,371,013

CLASS 141

91 4,371,014
352 4,371,015

CLASS 144

2 Z 4,371,016
3 D 4,371,017
4 4,371,018
193 A 4,371,019
366 4,371,020

CLASS 145

21 4,371,021

CLASS 148

1.5 4,371,403
3 4,371,404
111 4,371,405
171 4,371,406
187 4,371,407

CLASS 149

21 4,371,408
94 4,371,409

CLASS 150

1.5 R 4,371,022
8 Re.31,135

CLASS 152

158 4,371,023
4,371,024
352 R 4,371,025

CLASS 156

117 4,371,410
244.11 Re.31,137
281 4,371,411
345 4,371,412
349 4,371,413
361 4,371,414
433 4,371,415
441.5 4,371,416
473 Re.31,138
495 4,371,417
497 4,371,418
617 SP 4,371,419
624 4,371,420
4,371,421
640 4,371,422
653 4,371,423

CLASS 160

349 D 4,371,026

CLASS 165

1 4,371,027
10 4,371,028
4,371,029
54 4,371,031
91 4,371,032
104.16 4,371,033
108 4,371,034
162 4,371,035
163 4,371,036

CLASS 166

366 4,371,037
380 4,371,038

CLASS 172

244 4,371,039

CLASS 173

11 4,371,040
28 4,371,041
127 4,371,042
162 H 4,371,043

CLASS 174

15 S 4,371,741
36 4,371,742
52 R 4,371,743
68.5 4,371,744
115 4,371,745

CLASS 175

4.6 4,371,044
17 4,371,045
57 4,371,046

CLASS 178

18 4,371,746

CLASS 179

1 GS 4,371,747
4,371,749
1 J 4,371,748
1 VL 4,371,750
5 R 4,371,751
7.1 TP 4,371,752
18 BE 4,371,754
18 GF 4,371,753
35 4,371,755
4,371,756
98 4,371,757
175.2 C 4,371,758

CLASS 180

54 A 4,371,047
69 R 4,371,048
255 4,371,049
271 4,371,050
4,371,051
287 4,371,052

CLASS 181

249 4,371,053
252 4,371,054

CLASS 182

46 4,371,055
127 4,371,056
184 4,371,057

CLASS 185

11 4,371,058

CLASS 188

71.8 4,371,059
73.38 4,371,060
244 4,371,061

CLASS 192

3.61 4,371,062
4 A 4,371,063
6 A 4,371,064
8 C 4,371,065
85 AA 4,371,066
93 A 4,371,067
98 4,371,068
135 4,371,069

CLASS 194

4 D 4,371,070
4 R 4,371,071
54 4,371,072
102 4,371,073

CLASS 198

339 4,371,074
345 4,371,075
420 4,371,076

CLASS 200

5 A 4,371,760
5 R 4,371,759
27 BA 4,371,761
61.43 4,371,762
61.45 R 4,371,763
61.86 4,371,764
147 R 4,371,765
148 A 4,371,766
335 4,371,767

CLASS 202

159 4,371,424
228 4,371,425

CLASS 203

2 4,371,426
3 4,371,427
51 4,371,428

CLASS 204

4 4,371,429
32 R 4,371,430
59 R 4,371,431
129.35 4,371,432
228 4,371,433
302 4,371,434

CLASS 206

45.14 4,371,077
329 4,371,078
349 4,371,079
531 4,371,080

CLASS 209

44 4,371,435
268 4,371,436
580 4,371,081

CLASS 210

94 4,371,437
232 4,371,438
4,371,439
601 4,371,440
649 4,371,441
661 4,371,442

CLASS 211

22 4,371,082
26 4,371,083
126 4,371,084
149 4,371,085

CLASS 212

253 4,371,086

CLASS 215

12 R 4,371,087
220 4,371,088
256 4,371,089

CLASS 219

10.53 4,371,768
10.55 D 4,371,770
10.55 F 4,371,769
70 4,371,771
89 4,371,772
98 4,371,773
121 EA 4,371,774
121 PK 4,371,775
130.51 4,371,776
298 4,371,777
302 4,371,778
328 4,371,779
446 4,371,780

CLASS 220

224 4,371,090
288 4,371,091
324 4,371,092

CLASS 221

90 4,371,093

CLASS 222

1 4,371,094
153 4,371,095
190 4,371,096
321 4,371,097
4,371,098
4,371,099
591 4,371,100
636 4,371,101

CLASS 223

73 4,371,102

CLASS 225

1 4,371,103
48 4,371,104

CLASS 228

7 4,371,105
19 4,371,106
32 4,371,107
173 C 4,371,108

CLASS 229

28 R 4,371,109
31 FS 4,371,110

CLASS 235

101 4,371,781

CLASS 237

8 R 4,371,111
12.3 A 4,371,112

CLASS 239

201 4,371,113
309 4,371,114
524 4,371,115
720 4,371,116

CLASS 241

18 4,371,117
30 4,371,118
66 4,371,119
284 4,371,120

CLASS 242

18 DD 4,371,121
43 R 4,371,122
71.8 4,371,123
84.51 A 4,371,124
107 4,371,125
107.2 4,371,126
4,371,127
107.4 A 4,371,128
118.7 4,371,129
125.1 4,371,130
199 4,371,131

CLASS 244

53 B 4,371,132
54 4,371,133
173 4,371,134
4,371,135

CLASS 248

49 4,371,136
73 4,371,137
201 4,371,138
237 4,371,139
359 4,371,140
569 4,371,141
573 4,371,142
638 4,371,143
641 4,371,144

CLASS 249

80 4,371,145

CLASS 250

202 4,371,782
227 4,371,783
231 GY 4,371,784
343 4,371,785
4,371,786

CLASS 251

209 4,371,146

CLASS 252

8.55 C 4,371,443
8.55 D 4,371,444
12 4,371,445
51.5 A 4,371,446
73 4,371,447
78.1 4,371,448
142 4,371,449
189 4,371,450
305 4,371,451
373 4,371,452
417 4,371,453
422 4,371,454
429 C 4,371,455
435 4,371,456
437 4,371,457
439 4,371,458
514 4,371,459
522 R 4,371,460
547 4,371,461

CLASS 254

326 4,371,147

CLASS 256

26 4,371,148

CLASS 260

112 R 4,371,462
112.5 E 4,371,463
112.5 R 4,371,464
4,371,465
4,371,466
165 4,371,467
239 BD 4,371,468
405.6 4,371,469
428 4,371,470
438.5 R 4,371,471
453 RY 4,371,472
465 G 4,371,473
465.8 R 4,371,474
512 R 4,371,475
709 4,371,476

CLASS 261

30 4,371,477
44 C 4,371,478
4,371,479
87 4,371,480

CLASS 264

15 4,371,481
40.1 4,371,482
40.6 4,371,483
44 4,371,484
46.1 4,371,485
46.6 4,371,486
49 4,371,487
51 4,371,488
129 4,371,489
162 4,371,490
196 4,371,491
226 4,371,492
236 4,371,493
522 4,371,494

CLASS 266

90 4,371,149
155 4,371,150
186 4,371,151

CLASS 267

103 4,371,152
105 4,371,153
179 4,371,154

CLASS 270

53 4,371,155
54 4,371,156

CLASS 271

2 4,371,157
103 4,371,158
228 4,371,159

CLASS 272

96 4,371,160
4,371,161
134 4,371,162

CLASS 273

54 B 4,371,163
121 A 4,371,164
147 4,371,165
157 R 4,371,166
161 4,371,167
239 4,371,168
271 4,371,169
4,371,170
357 4,371,171

CLASS 277

12 4,371,172
4,371,173
24 4,371,174
34 4,371,175
56 4,371,176
152 4,371,177
154 4,371,178
207 A 4,371,179
230 4,371,180

CLASS 280

5 A 4,371,181
6 H 4,371,182
42 4,371,183
204 4,371,184
227 4,371,185
432 4,371,186
605 4,371,187
613 4,371,188
682 4,371,189
705 4,371,190
707 4,371,191
801 4,371,192
806 4,371,193

CLASS 281

21 R 4,371,194
4,371,195

CLASS 283

7 4,371,196

CLASS 285

47 4,371,197
165 4,371,198
382.2 4,371,199

CLASS 290

42 4,371,788

CLASS 292

48 4,371,205
99 4,371,200
251 4,371,201

CLASS 294

82 R 4,371,202
86 R 4,371,203

CLASS 296

218 4,371,204

CLASS 297

183 4,371,206
348 4,371,207

CLASS 298

23 D 4,371,208

CLASS 299

1 4,371,209
10 4,371,210
11 4,371,211

CLASS 301

9 DN 4,371,212
12 R 4,371,213
126 4,371,214

CLASS 303

22 R 4,371,215

CLASS 307

38 4,371,789
118 4,371,790
141 4,371,791
255 4,371,792
260 4,371,793
269 4,371,794
440 4,371,795
476 4,371,796
577 4,371,797

CLASS 308

5 R 4,371,217
10 4,371,218

CLASS 310

15 4,371,800
80 4,371,798
154 4,371,799
156 4,371,801
166 4,371,802
242 4,371,803
321 4,371,804
334 4,371,805

CLASS 312

199 4,371,221
211 4,371,222
325 4,371,223

CLASS 313

101 4,371,806
318 4,371,807
411 4,371,808
449 4,371,809
487 4,371,810

CLASS 315

241 P 4,371,811
291 4,371,812
377 4,371,813

CLASS 316

32 4,371,224

CLASS 318

16 4,371,814
114 4,371,815
116 4,371,816
254 4,371,817
313 4,371,818
341 4,371,819
468 4,371,820
696 4,371,821
4,371,822
705 4,371,823
722 4,371,824

CLASS 320

5 4,371,825
21 4,371,826
48 4,371,827

CLASS 322

32 4,371,828

CLASS 323

209 4,371,829
265 4,371,830
284 4,371,831

CLASS 324

51 4,371,832
161 4,371,833
187 4,371,834
174 4,371,835
207 4,371,836
225 4,371,837
244 4,371,838

CLASS 329

104 4,371,839

CLASS 330

10 4,371,840
51 4,371,841
141 4,371,842
253 4,371,843
4,371,844
277 4,371,845
278 4,371,846
307 4,371,847

CLASS 331

91 4,371,848
96 4,371,849

CLASS 332

11 D 4,371,850

CLASS 333

17 L 4,371,851
157 4,371,852
204 4,371,853
252 4,371,854

CLASS 335

132 4,371,855
202 4,371,856
259 4,371,857

CLASS 336

100 4,371,858

CLASS 337

365 4,371,859

CLASS 338

21 4,371,860
25 4,371,861
174 4,371,862

CLASS 339

97 C 4,371,225
147 R 4,371,226
211 4,371,227
221 R 4,371,228
223 R 4,371,229
242 4,371,230
275 R 4,371,231

CLASS 340

43 4,371,863
62 4,371,864
146.3 F 4,371,866
146.3 MA 4,371,865
310 R 4,371,867
347 CC 4,371,868
557 4,371,869
716 4,371,870
717 4,371,871
728 4,371,872

CLASS 343

9 PS 4,371,873
18 B 4,371,874
708 4,371,875
768 4,371,876
770 4,371,877

CLASS 346

75 4,371,878
135.1 4,371,879
140 R 4,371,880
4,371,881

CLASS 350

1.4 4,371,232
96.18 4,371,233
96.23 4,371,234
280 4,371,235
357 4,371,236

CLASS 351

106 4,371,238
245 4,371,237

CLASS 352

140 4,371,240
4,371,241

CLASS 353

26 R 4,371,239
101 4,371,242

CLASS 354

43 4,371,243
173 4,371,244
198 4,371,245
299 4,371,246
300 4,371,247
304 4,371,248
4,371,249
325 4,371,250

CLASS 355

3 CH 4,371,252
3 TR 4,371,251
4 4,371,253
8 4,371,254
4,371,255
14 D 4,371,257
14 SH 4,371,256
37 4,371,258
38 4,371,259
77 4,371,260

CLASS 356

1 4,371,261
312 4,371,262
333 4,371,263
356 4,371,264
432 4,371,265

CLASS 357

4 4,371,882
8 4,371,883
12 4,371,884
24 4,371,885
38 4,371,886
4,371,887
59 4,371,890

CLASS 358

31 4,371,891
75 4,371,892
93 4,371,893
136 4,371,895
167 4,371,266
172 4,371,896
294 4,371,897
300 4,371,898
315 4,371,899
342 4,371,894

CLASS 360

40 4,371,900
65 4,371,901
75 4,371,902
4,371,903
77 4,371,904
112 4,371,905

CLASS 361

51 4,371,906
82 4,371,907
83 4,371,908
91 4,371,909
106 4,371,910
124 4,371,911
417 4,371,912

CLASS 362

15 4,371,914
4,371,915
17 4,371,913
31 4,371,916

CLASS 363

21 4,371,917
22 4,371,918
65 4,371,919
160 4,371,920

CLASS 364

138 4,371,921
144 4,371,922
200 4,371,923
4,371,924
4,371,925
4,371,926
4,371,927
4,371,928
4,371,929
4,371,930
4,371,931

4,371,932
300 4,371,933
424 4,371,934
4,371,935
434 4,371,936
4,371,937
4,371,938
4,371,939
444 4,371,940
475 4,371,941
4,371,942
481 4,371,943
502 4,371,944
561 4,371,945
822 4,371,946
900 4,371,947
4,371,948
4,371,949
4,371,950
4,371,951
4,371,952

CLASS 365

103 4,371,953
126 4,371,954
185 4,371,955
4,371,956

CLASS 367

3 4,371,957
85 4,371,958

CLASS 368

74 4,371,267
82 4,371,268
205 4,371,269

CLASS 369

43 4,371,959
4,371,960
126 4,371,961

CLASS 370

100 4,371,962

CLASS 371

38 4,371,270
50 4,371,963

CLASS 372

38 4,371,964
40 4,371,965
45 4,371,966
4,371,967
50 4,371,968
77 4,371,969

CLASS 373

74 4,371,970
115 4,371,971

CLASS 374

183 4,371,271
184 4,371,272

CLASS 375

30 4,371,972
58 4,371,973
82 4,371,974
120 4,371,975

CLASS 376

209 4,371,495
258 4,371,496

CLASS 378

16 4,371,976
51 4,371,977

CLASS 384

118 4,371,216
291 4,371,219
371 4,371,220

CLASS 400

119 4,371,273
121 4,371,274
161.3 4,371,275
625 4,371,276

CLASS 401

54 4,371,277
195 4,371,278

CLASS 403

8 4,371,279
13 4,371,280
219 4,371,281
277 4,371,282
288 4,371,283
301 4,371,284
339 4,371,285
407 4,371,286

CLASS 404

84 4,371,287

CLASS 405

53 4,371,288
150 4,371,289
4,371,290
169 4,371,291
224 4,371,292
259 4,371,293

CLASS 406

109 4,371,294
128 4,371,295

CLASS 407

115 4,371,296

CLASS 408

130 4,371,297

CLASS 410

25 4,371,298
44 4,371,299

CLASS 411

41 4,371,300
517 4,371,301

CLASS 414

22 4,371,302
281 4,371,303
293 4,371,304
300 4,371,305
325 4,371,306
416 4,371,308
676 4,371,309
725 4,371,307

CLASS 415

182 4,371,311
200 4,371,312
211 4,371,310
215 4,371,313

CLASS 416

20 A 4,371,314

CLASS 417

5 4,371,315
41 4,371,316
298 4,371,317
304 4,371,318
312 4,371,319
461 4,371,320

CLASS 418

45 4,371,321
47 4,371,322
55 4,371,323
201 4,371,324

CLASS 419

56 4,371,396

CLASS 422

12 4,371,497
102 4,371,498
111 4,371,499
115 4,371,500
142 4,371,501
186.06 4,371,787
249 4,371,502
307 4,371,503

CLASS 423

10 4,371,504
4,371,505
24 4,371,506
230 4,371,507
242 4,371,508
300 4,371,509
329 4,371,510
456 4,371,511
551 4,371,512
625 4,371,513

CLASS 424

1 4,371,514
22 4,371,516
70 4,371,517
78 4,371,518
81 4,371,519
85 4,371,520
94 4,371,521
153 4,371,522
178 4,371,523
180 4,371,524
184 4,371,525
200 4,371,526
204 4,371,527
241 4,371,528
243 4,371,529
244 4,371,530
246 4,371,531
248.51 4,371,532
248.54 4,371,533
248.55 4,371,534
251 4,371,535
256 4,371,536
263 4,371,537
267 4,371,538
272 4,371,539
273 R 4,371,540
4,371,541
274 4,371,542
319 4,371,543
322 4,371,544
330 4,371,545
4,371,546
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316 4,371,736
370 4,371,737

CLASS 546

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190 4,371,695
283 4,371,696

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262 4,371,700

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D2—	241	267,752	D7—	9	267,765		424	267,778	D12—	110	267,792			267,804		68	267,816
D3—	40	267,753		38	267,766		434	267,779		156	267,793	D18—	1	267,805	D25—	63	267,817
	72	267,754			267,767			267,780		337	267,794		14	267,806	D26—	35	267,818
D4—	38.1	267,755		76	267,768		447	267,781	D13—	10	267,795	D19—	12	267,829		37	267,819
D6—	47	267,756		332	267,769			267,782		11	267,796		24	267,807	D27—	42	267,820
	56	267,757		346	267,770		499	267,783	D14—	2	267,797		78	267,808	D28—	38	267,821
	63	267,758		376	267,771	D10—	30	267,784		11	267,798		88	267,809		86	267,822
	66	267,759	D8—	9	267,772			267,785		94	267,799	D20—	43	267,810	D32—	14	267,823
	97	267,760		57	267,773		81	267,786		114	267,787	D21—	253	267,811		16	267,824
	99	267,761		317	267,774	D11—	5	267,788	D15—	13	267,800	D23—	35	267,812		41	267,825
	113	267,762		380	267,775		81	267,789	D16—	30	267,801		55	267,813		48	267,826
	234	267,763		396	267,776		83	267,790		31	267,802	D24—	46	267,814		51	267,827
	246	267,764	D9—	347	267,777		137	267,791		32	267,803		59	267,815	D92—	32	267,828

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19 : 267,772
24 : 267,796

267,807
25 : 267,828
26 : 267,793
267,816
27 : 267,824
34 : 267,781
267,782
267,822
36 : 267,762

267,801
267,803
267,804
267,808
267,814
267,826
39 : 267,823
40 : 267,754
267,769

42 : 267,765
267,825
47 : 267,766
267,767
48 : 267,763
267,775
51 : 267,795
267,817
55 : 267,813

PLANT PATENTS

17 : 4,979

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

08 : T102,701

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